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NASA Grant NAS5-27344 : Laser Ranging Data Analysis

Final Report for 1987

In the period from November 1986 through 1987, Center for Space Research efforts under NASA Grant NAS5-27344 have focused on the near real-time analysis of Lageos laser ranging data. The data is analysed in terms of range bias, time bias, and internal precision, and estimates for the Earth orientation parameters X_p , Y_p and UT1 are obtained. The results of these analyses are reported in a variety of formats. Each week, a summary of the quick look data and Earth orientation parameters are posted on the GE Mark III system, and electronically mailed to a number of researchers worldwide using BITNET and SPAN. Any results of the weekly analysis that point to anomalous station performance, and which may be previously unknown to the station personnel, are raised and discussed by UT/CSR representatives at the bi-weekly NASA Crustal Dynamics Project Telecon. This rapid feedback enables identification and correction of the problem's source with as little delay as possible. The results are also reported in monthly bins which are sent using conventional mail, though at some delay compared with the weekly solutions. Copies of the Monthly summaries from November, 1986 through November, 1987 are included as Appendix 1. This effort has been continued under NASA Grant NAG5-1021 since December, 1987.

(NASA-CR-183115) LASER RANGING DATA
ANALYSIS Final Report, 1987 (Texas Univ.)
109 p CSCI 171

N88-26567

Unclas
G3/32 0154969

APPENDIX 1

Monthly Reports for December 1986–November 1987

ANALYSIS OF LAGEOS LASER RANGE DATA

DECEMBER 1986

CENTER FOR SPACE RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712

PREPARED FOR:
NASA CONTRACT NAS5-27344

ANALYSIS OF LAGEOS LASER RANGE DATA

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- A. Polar Motion Solutions from Quick-Look Data
- B. Monthly Quick-Look Data Summary and Quality

Questions and comments should be addressed to:

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SPAN: UTSPAN::UTCSR::SCHUTZ

A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

DECEMBER 1986 RAW VALUES
System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
773	86	12	5	46769	-31	1314	3425	1272	19	19	120	22	-3	-16	18
774	86	12	10	46774	6	1354	3342	1299	-16	17	118	-1	14	-1	16
775	86	12	15	46779	-2	1394	3243	1172	28	19	126	-28	-2	7	15
776	86	12	20	46784	-7	1393	3195	1293	22	24	163	-5	2	30	15
777	86	12	25	46789	-50	1432	3167	1307	23	24	245	-21	0	-13	12
778	86	12	30	46794	29	1423	3073	1562	31	27	401	0	8	3	14

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year MM: Month DD: Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of XP estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of YP estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of DR estimate (units: 1 μ s)

CXY: Correlation coefficient between XP and YP (units: 0.01)

CXD: Correlation coefficient between XP and DR (units: 0.01)

CYD: Correlation coefficient between YP and DR (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$
and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 773 ARC DATE: 86 12 5 (46769)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	41	10.8
7090 YARAG	50	35	15.2
7105 GRF105	50	78	7.8
7109 QUINC2	50	24	4.3
7110 MNPEAK	50	38	12.5
7130 GRF130	999900	48	8.8
7530 BARGIY	10000	20	10.8
7810 ZIMMER	100	19	8.0
7834 WETZEL	50	45	9.5
7835 GRASSE	200	128	11.5
7837 SHAHAI	500	45	20.5
7838 SHO	50	35	11.8
7839 GRAZ	50	69	9.6
7840 RGO	50	73	5.7
7843 ORLLR	200	19	18.5
7907 ARELAS	50	32	13.1
7939 MATERA	50	78	10.8
7920 GRF920	999900	32	19.1
TOTALS		859	10.2

ARC NO. 774 ARC DATE: 86 12 10 (46774)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	2	15.7
7086 MCDON	50	21	14.1
7090 YARAG	50	43	11.5
7109 QUINC2	50	106	6.0
7110 MNPEAK	50	91	5.5
7122 MAZTLN	50	31	4.9
7530 BARGIY	10000	37	17.2
7834 WETZEL	50	34	9.6
7835 GRASSE	200	48	10.6
7837 SHAHAI	500	23	16.9
7838 SHO	50	100	9.7
7840 RGO	50	100	7.1
7843 ORLLR	200	60	12.7
7907 ARELAS	50	15	11.1
7935 DODAIR	1000	4	14.8
7939 MATERA	50	79	13.3
TOTALS		794	9.1

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 775 ARC DATE: 86 12 15 (46779)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	50	12.2
7090 YARAG	50	45	14.0
7105 GRF105	50	103	7.9
7109 QUINC2	50	12	9.9
7110 MNPEAK	50	40	13.2
7122 MAZTLN	50	13	5.1
7130 GRF130	999900	57	8.0
7805 METFIN	200	3	9.4
7835 GRASSE	200	35	8.9
7838 SHO	50	51	10.2
7840 RGO	50	16	8.0
7843 ORLLR	200	20	14.3
7907 ARELAS	50	25	11.9
7935 DODAIR	1000	3	19.4
7939 MATERA	50	24	12.2
TOTALS		497	10.9

ARC NO. 776 ARC DATE: 86 12 20 (46784)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7090 YARAG	50	57	9.7
7105 GRF105	50	57	11.3
7109 QUINC2	50	8	3.8
7110 MNPEAK	50	26	12.3
7122 MAZTLN	50	19	5.6
7130 GRF130	999900	10	14.6
7210 HOLLAS	50	16	6.2
7530 BARGIY	10000	9	13.3
7835 GRASSE	200	74	10.7
7838 SHO	50	16	10.2
7839 GRAZ	50	22	5.5
7840 RGO	50	133	9.6
7843 ORLLR	200	53	10.1
7907 ARELAS	50	8	9.6
7939 MATERA	50	23	10.6
TOTALS		531	9.6

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 777 ARC DATE: 86 12 25 (46789)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7090 YARAG	50	41	9.4
7105 GRF105	50	20	10.6
7109 QUINC2	50	24	8.1
7110 MNPEAK	50	7	5.4
7122 MAZTLN	50	20	4.3
7210 HOLLAS	50	5	11.9
7530 BARGIY	10000	19	18.0
7838 SHO	50	104	8.4
7839 GRAZ	50	28	7.8
7840 RGO	50	96	7.6
7843 ORLLR	200	34	14.2
7920 GRF920	999900	9	24.8
TOTALS		407	8.3

ARC NO. 778 ARC DATE: 86 12 30 (46794)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7090 YARAG	50	47	7.9
7105 GRF105	50	63	10.8
7109 QUINC2	50	11	6.8
7110 MNPEAK	50	9	9.8
7122 MAZTLN	50	13	4.3
7130 GRF130	999900	17	10.7
7210 HOLLAS	50	17	13.1
7530 BARGIY	10000	11	13.4
7835 GRASSE	200	33	4.5
7839 GRAZ	50	15	13.7
7840 RGO	50	33	8.4
7843 ORLLR	200	28	10.4
7939 MATERA	50	39	10.6
7920 GRF920	999900	13	21.7
TOTALS		349	9.9

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR) 85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

December 1986

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yarangadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7130 GRF130	TLRS-2; GSFC, Greenbelt, Maryland
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7805 METFIN	Geodetic Institute; Metsahovi, Finland
7810 ZIMMER	Inst. of Astron., Univ. of Bern; Zimmerwald, Switzerland
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7835 GRASSE	GRGS/CERGA; Grasse, France
7837 SHAHAI	Shanghai Observatory; Shanghai, PRC
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORLLR	Division of National Mapping; Orrol, Australia
7907 ARELAS	SAO; Arequipa, Peru
7920 GRF920	TLRS-1; GSFC, Greenbelt, Maryland
7935 DODAIR	Tokyo Astronomical Observatory; Dodaira, Japan
7939 MATERA	PSN; Matera, Italy

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR DECEMBER 1986**

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>TOTAL OBS</i>	<i>EDITED OBS⁺</i>	<i>PCT EDITED</i>	<i>GOOD OBS</i>	<i>RAW RMS</i>	<i>RB TB RMS</i>	<i>PRECISION ESTIMATE</i>
1181 POTSDM	3	89	86	96.6	3	4.6	.6	.0
7086 MCDON	16	789	13	1.6	776	8.2	6.2	6.1
7090 YARAG	25	1245	17	1.4	1228	5.4	1.4	1.3
7105 GRF105	28	1339	24	1.8	1315	4.2	1.0	.9
7109 QUINC2	18	900	26	2.9	874	4.5	.9	.9
7110 MNPEAK	24	1169	61	5.2	1108	10.1	8.4 ⁺⁺	8.3 ⁺⁺
7122 MAZTLN	10	499	4	.8	495	4.4	2.8	2.7
7130 GRF130	14	688	*	*	*	*	*	*
7210 HOLLAS	10	459	46	10.0	413	6.2	3.3	3.3
7530 BARGIY	13	620	126	20.3	494	18.0	12.5	12.3
7805 METFIN	3	14	11	78.6	3	23.3	14.0	.0
7810 ZIMMER	4	200	5	2.5	195	12.8	8.3	8.3
7834 WETZEL	12	468	11	2.4	457	8.9	4.7	4.5
7835 GRASSE	28	1525	4	.3	1521	9.4	4.6	4.3
7837 SHAHAI	9	476	81	17.0	395	16.9	14.7	14.3
7838 SHO	31	1028	160	15.6	868	7.6	4.4	3.6
7839 GRAZ	19	897	2	.2	895	7.3	2.9	2.8
7840 RGO	44	1849	46	2.5	1803	7.7	5.2	4.9
7843 ORLLR	26	597	1	.2	596	11.0	2.8	2.3
7907 ARELAS	16	800	317	39.6	483	15.3	13.4	13.2
7920 GRF920	10	500	*	*	*	*	*	*
7935 DODAIR	9	474	467	98.5	7	20.2	10.4	10.4
7939 MATERA	29	1438	183	12.7	1255	14.4	12.4	12.0
TOTALS	401	18063	2199	12.2	15864	9.4	6.7	6.4

+ See Edit Criteria listed in the January 1986 report.

++ Abnormally large due to noisy data from 15 Dec 86 to 29 Dec 86.

* Data collected for engineering evaluation.

QUICK-LOOK NORMAL POINT SUMMARY FOR DECEMBER 1986

STA ID	NO OF PASSES	NO OF NPTS	PTS/ NPT	NPTS/ PASS	EF SIG	NPT WRMS	AF SIG	NPT RMS
1181 POTSDM	1	2	1.5	2.0	40.8	.0	42.7	.0
7086 MCDON	16	164	4.7	10.3	2.4	2.3	3.3	3.4
7090 YARAG	25	303	4.1	12.1	.6	.6	.7	.8
7105 GRF105	28	316	4.2	11.3	.4	.4	.5	.6
7109 QUINC2	18	195	4.5	10.8	.4	.4	.5	.5
7110 MNPEAK	23	222	5.0	9.7	.5	.5	2.5	4.1
7122 MAZTLN	10	96	5.2	9.6	1.1	1.2	1.4	1.4
7210 HOLLAS	10	63	6.6	6.3	1.2	1.2	1.6	1.6
7530 BARGIY	13	113	4.4	8.7	5.1	4.5	7.2	7.3
7805 METFIN	1	3	1.0	3.0	50.0	.0	50.0	.0
7810 ZIMMER	4	30	6.5	7.5	3.1	3.0	4.3	4.4
7834 WETZEL	12	97	4.7	8.1	1.9	1.7	2.3	2.1
7835 GRASSE	28	381	4.0	13.6	1.9	1.9	2.2	2.4
7837 SHAHAI	9	78	5.1	8.7	5.5	5.7	7.5	7.8
7838 SHO	27	319	2.7	11.8	1.9	2.1	2.2	2.7
7839 GRAZ	19	145	6.2	7.6	1.1	1.1	1.6	1.5
7840 RGO	43	451	4.0	10.5	2.3	2.2	2.8	3.0
7843 ORLLR	26	224	2.7	8.6	1.3	1.2	2.3	1.6
7907 ARELAS	14	104	4.6	7.4	6.0	5.0	7.8	7.1
7935 DODAIR	3	5	1.4	1.7	42.3	6.6	44.1	7.4
7939 MATERA	28	276	4.5	9.9	5.4	5.2	6.6	7.5
TOTALS	372	3719	4.3	10.0	.8	.8	2.8	3.6

ANALYSIS OF LAGEOS LASER RANGE DATA

JANUARY 1987

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A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

JANUARY 1987 RAW VALUES
System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
779	87	1	4	46799	87	1475	3034	1373	34	31	211	41	-20	-9	10
780	87	1	9	46804	-116	1451	2991	1334	22	21	146	-20	-3	0	13
781	87	1	14	46809	50	1385	2863	1045	33	19	118	-19	11	-4	12
782	87	1	19	46814	46	1394	2802	1108	46	27	124	-16	-35	-1	9
783	87	1	24	46819	-88	1340	2728	1053	33	23	218	-12	11	7	11
784	87	1	29	46824	-26	1341	2709	1169	25	30	251	6	-11	-33	10

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year MM: Month DD: Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of XP estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of YP estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of DR estimate (units: 1 μ s)

CXY: Correlation coefficient between XP and YP (units: 0.01)

CXD: Correlation coefficient between XP and DR (units: 0.01)

CYD: Correlation coefficient between YP and DR (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$
and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 779 ARC DATE: 87 1 4 (46799)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	11	8.9
7090 YARAG	50	7	12.0
7105 GRF105	50	88	5.7
7122 MAZTLN	50	12	6.7
7130 GRF130	999900	31	7.3
7835 GRASSE	200	40	8.0
7839 GRAZ	50	46	7.1
7840 RGO	50	66	6.7
7843 ORRLLR	200	22	7.4
7939 MATERA	50	34	11.3
TOTALS		357	7.5

ARC NO. 780 ARC DATE: 87 1 9 (46804)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	19	13.7
7090 YARAG	50	56	9.0
7105 GRF105	50	12	6.3
7122 MAZTLN	50	22	9.2
7130 GRF130	999900	13	7.6
7210 HOLLAS	50	14	11.1
7530 BARGIY	10000	7	12.3
7838 SHO	50	79	10.1
7839 GRAZ	50	56	7.8
7840 RGO	50	60	7.8
7843 ORRLLR	200	13	7.9
7907 ARELAS	50	6	14.8
7939 MATERA	50	15	14.8
TOTALS		372	9.7

ARC NO. 781 ARC DATE: 87 1 14 (46809)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7090 YARAG	50	63	12.3
7105 GRF105	50	36	6.2
7109 QUINC2	50	96	5.6
7110 MNPEAK	50	39	8.1
7122 MAZTLN	50	55	7.3
7130 GRF130	999900	14	10.6
7210 HOLLAS	50	14	15.5
7530 BARGIY	10000	27	18.7
7838 SHO	50	71	11.5
7840 RGO	50	20	15.0
7843 ORRLLR	200	75	9.9
7907 ARELAS	50	44	9.1
TOTALS		554	9.6

STATION CONTRIBUTIONS BY ARC

(Continued)

ARC NO. 782 ARC DATE: 87 1 19 (46814)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	41	8.9
7090 YARAG	50	18	11.1
7109 QUINC2	50	56	5.4
7110 MNPEAK	50	57	6.6
7210 HOLLAS	50	28	9.3
7530 BARGIY	10000	10	10.3
7834 WETZEL	50	6	23.5
7838 SHO	50	51	8.4
7843 ORLLR	200	46	13.8
TOTALS		313	8.7

ARC NO. 783 ARC DATE: 87 1 24 (46819)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	85	11.1
7090 YARAG	50	72	9.6
7105 GRF105	50	22	8.2
7109 QUINC2	50	14	9.4
7110 MNPEAK	50	48	8.8
7210 HOLLAS	50	30	9.9
7838 SHO	50	6	10.8
7839 GRAZ	50	21	15.8
7843 ORLLR	200	69	11.1
7939 MATERA	50	13	14.1
7920 GRF920	999900	12	9.1
TOTALS		392	10.6

ARC NO. 784 ARC DATE: 87 1 29 (46824)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	14	18.2
7086 MCDON	50	35	6.5
7090 YARAG	50	25	10.0
7105 GRF105	50	33	9.1
7210 HOLLAS	50	9	5.6
7838 SHO	50	22	11.3
7839 GRAZ	50	12	5.2
7840 RGO	50	134	8.9
7843 ORLLR	200	18	14.9
7920 GRF920	999900	35	17.0
TOTALS		337	9.0

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR) 85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

January 1987

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yaragadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7130 GRF130	TLRS-2; GSFC, Greenbelt, Maryland
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7835 GRASSE	GRGS/CERGA; Grasse, France
7837 SHAHAI	Shanghai Observatory; Shanghai, PRC
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORLLR	Division of National Mapping; Ororol, Australia
7907 ARELAS	SAO; Arequipa, Peru
7920 GRF920	TLRS-1; GSFC, Greenbelt, Maryland
7935 DODAIR	Tokyo Astronomical Observatory; Dodaira, Japan
7939 MATERA	PSN; Matera, Italy

555.if 518<486 .nr 60 486

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR JANUARY 1987**

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>TOTAL OBS</i>	<i>EDITED OBS⁺</i>	<i>PCT EDITED</i>	<i>GOOD OBS</i>	<i>RAW RMS</i>	<i>RB TB RMS</i>	<i>PRECISION ESTIMATE</i>
1181 POTSDM	3	110	57	51.8	53	21.6	12.9	12.9
7086 MCDON	26	1297	69	5.3	1228	6.3	5.0	4.9
7090 YARAG	22	1096	16	1.5	1080	3.8	1.5	1.3
7105 GRF105	21	1046	14	1.3	1032	3.8	1.1	.8
7109 QUINC2	13	648	11	1.7	637	4.2	.9	.9
7110 MNPEAK	18	900	9	1.0	891	5.2	1.0	1.0
7122 MAZTLN	12	594	9	1.5	585	4.6	2.3	2.1
7130 GRF130	5	244	*	*	*	*	*	*
7210 HOLLAS	14	682	42	6.2	640	7.5	3.6	3.5
7530 BARGIY	7	313	62	19.8	251	13.7	11.8	11.7
7834 WETZEL	2	65	.0	0.0	65	17.1	6.8	6.7
7835 GRASSE	11	598	110	18.4	488	10.3	4.5	4.4
7837 SHAHAI ⁺⁺	4	200	200	100.0	0	0.0	0.0	0.0
7838 SHO	25	794	7	.9	787	8.1	4.5	3.7
7839 GRAZ	24	1167	38	3.3	1129	6.8	3.0	3.0
7840 RGO	30	1165	6	.5	1159	8.2	5.1	4.9
7843 ORLLR	28	760	1	.1	759	9.3	2.7	2.1
7907 ARELAS	7	348	94	27.0	254	16.0	12.9	12.9
7920 GRF920	11	546	*	*	*	*	*	*
7935 DODAIR	1	43	43	100.0	0	0.0	0.0	0.0
7939 MATERA	5	248	12	4.8	236	13.4	11.6	11.2
TOTALS	289	12864	956	7.4	11908	7.9	4.5	4.4

+ See Edit Criteria listed in the January 1986 report.

⁺⁺ Data under investigation.

* Data collected for engineering evaluation.

QUICK-LOOK NORMAL POINT SUMMARY FOR JANUARY 1987

STA ID	NO OF PASSES	NO OF NPTS	PTS/ NPT	NPTS/ PASS	EF SIG	NPT WRMS	AF SIG	NPT RMS
1181 POTSDM	2	14	3.8	7.0	6.6	6.3	8.0	7.2
7086 MCDON	25	215	5.7	8.6	1.7	1.9	2.4	3.1
7090 YARAG	22	284	3.8	12.9	.6	.6	.7	.7
7105 GRF105	21	221	4.7	10.5	.3	.3	.5	.5
7109 QUINC2	13	167	3.8	12.8	.4	.4	.5	.5
7110 MNPEAK	18	168	5.3	9.3	.4	.4	.5	.5
7122 MAZTLN	12	133	4.4	11.1	.7	.8	1.0	1.3
7210 HOLLAS	14	111	5.8	7.9	1.4	1.3	1.8	2.0
7530 BARGIY	6	48	5.2	8.0	5.0	4.5	6.8	7.2
7834 WETZEL	2	10	6.5	5.0	2.6	1.3	3.1	1.6
7835 GRASSE	9	105	4.6	11.7	1.9	2.0	2.3	2.8
7838 SHO	25	268	2.9	10.7	2.0	2.2	2.3	2.8
7839 GRAZ	23	181	6.2	7.9	1.1	1.0	1.4	1.4
7840 RGO	30	291	4.0	9.7	2.3	2.4	3.6	3.1
7843 ORRLLR	28	278	2.7	9.9	1.2	1.3	1.3	1.5
7907 ARELAS	7	50	5.1	7.1	5.7	5.0	7.5	8.0
7939 MATERA	5	62	3.8	12.4	5.7	5.2	6.2	6.0
TOTALS	275	2733	4.4	9.9	.7	.7	1.9	2.6

ANALYSIS OF LAGEOS LASER RANGE DATA

FEBRUARY 1987

CENTER FOR SPACE RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712

PREPARED FOR:
NASA CONTRACT NAS5-27344

ANALYSIS OF LAGEOS LASER RANGE DATA

CONTENTS

- A. Polar Motion Solutions from Quick-Look Data
- B. Monthly Quick-Look Data Summary and Quality

Questions and comments should be addressed to:

Dr. B. E. Schutz or Mr. R. J. Eanes
Center for Space Research
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Commercial: 512/471-4267
FTS: 770-5244
TELEX: 704265 CSRUTX UD
GE Mark III: AUTA
BITNET: AOV5751@UTCHPC.BITNET
SPAN: UTSPAN::UTCSR::SCHUTZ

A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

FEBRUARY 1987 RAW VALUES
System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
785	87	2	3	46829	35	1288	2624	1530	25	20	129	14	-4	28	13
786	87	2	8	46834	9	1300	2608	1399	23	23	106	22	10	-11	11
787	87	2	13	46839	-64	1220	2516	1300	31	20	129	-9	9	-20	13
788	87	2	18	46844	36	1253	2487	1678	19	18	115	12	17	17	13
789	87	2	23	46849	31	1215	2431	1687	18	18	86	4	12	-20	16
790	87	2	28	46854	-71	1202	2379	1935	25	20	216	4	8	6	14

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year MM: Month DD: Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of XP estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of YP estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of DR estimate (units: 1 μ s)

CXY: Correlation coefficient between XP and YP (units: 0.01)

CXD: Correlation coefficient between XP and DR (units: 0.01)

CYD: Correlation coefficient between YP and DR (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$
and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 785

ARC DATE: 87 2 3 (46829)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	28	10.9
7090 YARAG	50	55	10.7
7105 GRF105	50	13	7.1
7110 MNPEAK	50	38	10.5
7122 MAZTLN	50	69	7.8
7210 HOLLAS	50	6	8.2
7834 WETZEL	50	18	15.6
7835 GRASSE	200	21	11.8
7838 SHO	50	11	5.6
7839 GRAZ	50	82	6.9
7840 RGO	50	44	9.1
7843 ORLLR	200	22	16.9
7907 ARELAS	50	21	10.8
TOTALS		428	9.4

ARC NO. 786

ARC DATE: 87 2 8 (46834)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	9	10.9
7105 GRF105	50	49	8.9
7109 QUINC2	50	30	3.9
7110 MNPEAK	50	12	14.6
7122 MAZTLN	50	46	5.3
7210 HOLLAS	50	9	11.7
7838 SHO	50	27	12.2
7839 GRAZ	50	52	7.7
7840 RGO	50	11	12.6
7907 ARELAS	50	35	11.6
7939 MATERA	50	95	10.2
TOTALS		375	9.5

ARC NO. 787

ARC DATE: 87 2 13 (46839)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	50	7.7
7090 YARAG	50	56	9.4
7105 GRF105	50	43	11.4
7109 QUINC2	50	14	9.3
7110 MNPEAK	50	36	10.3
7122 MAZTLN	50	54	6.5
7210 HOLLAS	50	18	10.7
7530 BARGIY	10000	12	13.4
7834 WETZEL	50	7	8.3
7838 SHO	50	42	11.8
7840 RGO	50	24	11.5
7843 ORLLR	200	14	6.4
7907 ARELAS	50	15	12.6
TOTALS		385	9.8

STATION CONTRIBUTIONS BY ARC

(Continued)

ARC NO. 788 ARC DATE: 87 2 18 (46844)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7090 YARAG	50	42	19.1
7105 GRF105	50	58	7.1
7109 QUINC2	50	67	5.4
7110 MNPEAK	50	87	10.1
7122 MAZTLN	50	67	8.2
7210 HOLLAS	50	10	6.6
7530 BARGIY	10000	29	13.8
7835 GRASSE	200	25	9.4
7838 SHO	50	12	12.3
7840 RGO	50	127	8.0
7843 ORLLR	200	8	8.1
7907 ARELAS	50	44	8.4
7939 MATERA	50	60	12.3
TOTALS		636	9.9

ARC NO. 789 ARC DATE: 87 2 23 (46849)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	17	20.8
7086 MCDON	50	31	9.7
7090 YARAG	50	77	11.1
7105 GRF105	50	8	10.9
7109 QUINC2	50	23	9.7
7110 MNPEAK	50	20	11.0
7122 MAZTLN	50	44	6.2
7210 HOLLAS	50	40	10.8
7530 BARGIY	10000	6	15.7
7835 GRASSE	200	40	8.2
7838 SHO	50	47	16.3
7839 GRAZ	50	58	5.8
7840 RGO	50	82	8.5
7843 ORLLR	200	25	9.0
7907 ARELAS	50	23	12.3
7939 MATERA	50	77	10.6
TOTALS		618	10.5

ARC NO. 790 ARC DATE: 87 2 28 (46854)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	25	18.6
7086 MCDON	50	2	3.0
7090 YARAG	50	46	15.6
7105 GRF105	50	36	5.2
7109 QUINC2	50	86	5.8
7122 MAZTLN	50	43	7.0
7210 HOLLAS	50	27	14.5
7835 GRASSE	200	30	11.7
7837 SHAHAI	500	7	18.8
7838 SHO	50	38	13.4
7839 GRAZ	50	20	5.2
7843 ORLLR	200	7	14.7
7907 ARELAS	50	11	10.3
7939 MATERA	50	36	12.3
TOTALS		414	10.6

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR) 85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

February 1987

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yaragadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7835 GRASSE	GRGS/CERGA; Grasse, France
7837 SHAHAI	Shanghai Observatory; Shanghai, PRC
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORLLR	Division of National Mapping; Orrol, Australia
7907 ARELAS	SAO; Arequipa, Peru
7935 DODAIR	Tokyo Astronomical Observatory; Dodaira, Japan
7939 MATERA	PSN; Matera, Italy

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR FEBRUARY 1987**

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>TOTAL OBS</i>	<i>EDITED OBS⁺</i>	<i>PCT EDITED</i>	<i>GOOD OBS</i>	<i>RAW RMS</i>	<i>RB TB RMS</i>	<i>PRECISION ESTIMATE</i>
1181 POTSDM	15	499	296	59.3	203	21.3	15.2	14.2
7086 MCDON	15	796	111	13.9	685	5.8	3.9	3.8
7090 YARAG	23	1148	18	1.6	1130	4.3	1.5	1.3
7105 GRF105	20	995	20	2.0	975	5.6	1.1	.8
7109 QUINC2	19	948	7	.7	941	4.4	1.0	.9
7110 MNPEAK	17	849	6	.7	843	4.9	1.1	1.0
7122 MAZTLN	28	1396	22	1.6	1374	3.8	1.0	.9
7210 HOLLAS	15	727	40	5.5	687	6.9	4.0	3.9
7530 BARGIY	10	443	63	14.2	380	16.9	12.2	12.1
7834 WETZEL	5	203	3	1.5	200	11.4	5.3	5.2
7835 GRASSE	10	536	58	10.8	478	9.9	3.7	3.3
7837 SHAHAI	2	100	12	12.0	88	19.8	14.6	14.6
7838 SHO	21	656	9	1.4	647	9.0	5.1	4.4
7839 GRAZ	26	1255	109	8.7	1146	5.9	3.1	3.0
7840 RGO	33	1136	2	.2	1134	7.3	5.5	5.3
7843 ORRLLR	7	189	2	1.1	187	9.2	4.0	2.8
7907 ARELAS	27	1348	477	35.4	871	14.6	13.4	13.4
7935 DODAIR	6	222	222	100.0	0	0.0	0.0	0.0
7939 MATERA	21	1041	81	7.8	960	13.6	12.3	12.0
TOTALS	320	14487	1558	10.8	12929	8.8	6.4	6.2

+ See Edit Criteria listed in the January 1986 report.

QUICK-LOOK NORMAL POINT SUMMARY FOR FEBRUARY 1987

STA ID	NO OF PASSES	NO OF NPTS	PTS/ NPT	NPTS/ PASS	EFSIG	NPT WRMS	AFSIG	NPT RMS
1181 POTSDM	10	64	3.2	6.4	8.2	7.6	12.4	8.9
7086 MCDON	14	123	5.6	8.8	1.5	1.4	1.9	2.0
7090 YARAG	23	301	3.8	13.1	.6	.6	.7	.8
7105 GRF105	20	232	4.2	11.6	.4	.4	.5	.5
7109 QUINC2	19	235	4.0	12.4	.4	.4	.5	.6
7110 MNPEAK	17	193	4.4	11.4	.5	.4	.5	.5
7122 MAZTLN	28	342	4.0	12.2	.4	.4	.5	.6
7210 HOLLAS	15	123	5.6	8.2	1.5	1.4	1.9	1.9
7530 BARGIY	10	68	5.6	6.8	5.0	4.3	6.9	7.5
7834 WETZEL	5	29	6.9	5.8	2.0	1.6	2.6	2.3
7835 GRASSE	9	103	4.6	11.4	1.5	1.6	1.8	2.1
7837 SHAHAI	2	13	6.8	6.5	5.4	5.5	6.7	8.1
7838 SHO	21	202	3.2	9.6	2.2	2.4	2.6	3.3
7839 GRAZ	24	203	5.6	8.5	1.2	1.1	1.5	1.6
7840 RGO	33	316	3.6	9.6	2.5	2.7	4.9	3.4
7843 ORLLR	7	69	2.7	9.9	1.4	1.6	1.7	2.1
7907 ARELAS	26	160	5.4	6.2	5.6	4.9	7.0	6.8
7939 MATERA	21	257	3.7	12.2	6.1	5.8	7.1	7.0
TOTALS	304	3033	4.3	10.0	.7	.7	2.7	3.6

ANALYSIS OF LAGEOS LASER RANGE DATA

MARCH 1987

CENTER FOR SPACE RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712

PREPARED FOR:
NASA CONTRACT NAS5-27344

ANALYSIS OF LAGEOS LASER RANGE DATA

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- A. Polar Motion Solutions from Quick-Look Data
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Dr. B. E. Schutz or Mr. R. J. Eanes
Center for Space Research
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Commercial: 512/471-4267
FTS: 770-5244
TELEX: 704265 CSRUTX UD
GE Mark III: AUTA
BITNET: AOV5751@UTCHPC.BITNET
SPAN: UTSPAN::UTCSR::SCHUTZ

A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

MARCH 1987 RAW VALUES
System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
791	87	3	5	46859	-3	1162	2306	2007	23	19	114	15	4	1	17
792	87	3	10	46864	68	1085	2236	1617	23	24	213	9	-9	4	13
793	87	3	15	46869	-49	1085	2174	1657	27	20	110	13	-13	-10	13
794	87	3	20	46874	-15	1066	2153	1784	20	16	111	22	-4	-2	16
795	87	3	25	46879	33	1019	2138	1666	16	17	107	26	-5	23	15
796	87	3	30	46884	74	957	2087	1707	22	21	95	36	14	19	17

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year MM: Month DD: Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of XP estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of YP estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of DR estimate (units: 1 μ s)

CXY: Correlation coefficient between XP and YP (units: 0.01)

CXD: Correlation coefficient between XP and DR (units: 0.01)

CYD: Correlation coefficient between YP and DR (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$
and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 791 ARC DATE: 87 3 5 (46859)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	11	16.5
7086 MCDON	50	116	9.1
7090 YARAG	50	27	14.2
7105 GRF105	50	106	8.0
7109 QUINC2	50	25	4.6
7110 MNPEAK	50	13	7.6
7122 MAZTLN	50	32	6.2
7210 HOLLAS	50	29	11.5
7835 GRASSE	200	38	15.3
7837 SHAHAI	500	16	17.4
7838 SHO	50	7	13.4
7839 GRAZ	50	98	8.4
7840 RGO	50	19	13.1
7843 ORRLR	200	10	11.4
7907 ARELAS	50	24	10.8
7935 DODAIR	1000	7	21.0
8833 KOTWK2	10000	16	18.8
TOTALS		594	9.3

ARC NO. 792 ARC DATE: 87 3 10 (46864)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	27	16.0
7086 MCDON	50	22	7.1
7090 YARAG	50	29	12.3
7105 GRF105	50	13	14.1
7110 MNPEAK	50	15	4.8
7122 MAZTLN	50	34	5.6
7210 HOLLAS	50	8	16.5
7834 WETZEL	50	3	10.7
7838 SHO	50	22	12.5
7839 GRAZ	50	25	12.4
7840 RGO	50	141	7.4
7843 ORRLR	200	123	12.3
7907 ARELAS	50	6	7.2
TOTALS		468	9.5

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 793 ARC DATE: 87 3 15 (46869)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
1181 POTSDM	100	41	17.7
7086 MCDON	50	53	8.0
7090 YARAG	50	39	6.4
7105 GRF105	50	43	10.7
7109 QUINC2	50	13	5.8
7122 MAZTLN	50	59	4.5
7834 WETZEL	50	13	7.0
7835 GRASSE	200	44	8.4
7839 GRAZ	50	19	4.9
7840 RGO	50	123	8.1
7843 ORRLLR	200	5	11.2
7907 ARELAS	50	27	11.6
7939 MATERA	50	21	11.5
TOTALS		500	8.5

ARC NO. 794 ARC DATE: 87 3 20 (46874)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
1181 POTSDM	100	16	16.6
7086 MCDON	50	94	8.9
7090 YARAG	50	37	12.6
7105 GRF105	50	66	8.6
7109 QUINC2	50	10	3.2
7110 MNPEAK	50	36	6.0
7122 MAZTLN	50	15	3.7
7210 HOLLAS	50	12	19.2
7834 WETZEL	50	8	6.3
7835 GRASSE	200	52	11.1
7838 SHO	50	17	8.7
7839 GRAZ	50	49	7.1
7840 RGO	50	89	9.2
7843 ORRLLR	200	4	8.0
7907 ARELAS	50	35	9.6
7939 MATERA	50	89	11.5
TOTALS		629	9.6

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 795 ARC DATE: 87 3 25 (46879)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	9	20.2
7086 MCDON	50	121	8.8
7105 GRF105	50	42	6.5
7109 QUINC2	50	109	4.7
7110 MNPEAK	50	77	6.8
7122 MAZTLN	50	16	3.7
7210 HOLLAS	50	29	13.1
7530 BARGIY	10000	10	14.2
7810 ZIMMER	100	21	11.5
7834 WETZEL	50	17	5.7
7838 SHO	50	42	13.8
7839 GRAZ	50	28	4.9
7840 RGO	50	30	9.0
7907 ARELAS	50	30	13.9
7939 MATERA	50	117	11.5
TOTALS		698	9.2

ARC NO. 796 ARC DATE: 87 3 30 (46884)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	44	8.7
7090 YARAG	50	22	18.1
7105 GRF105	50	24	10.8
7109 QUINC2	50	83	7.3
7110 MNPEAK	50	74	9.3
7122 MAZTLN	50	49	6.5
7210 HOLLAS	50	26	12.5
7530 BARGIY	10000	35	16.1
7810 ZIMMER	100	50	11.6
7834 WETZEL	50	5	11.8
7835 GRASSE	200	67	8.7
7838 SHO	50	11	11.8
7840 RGO	50	52	6.8
7843 ORLLR	200	6	19.7
7907 ARELAS	50	34	10.4
7935 DODAIR	1000	2	10.6
7939 MATERA	50	46	12.1
TOTALS		630	9.9

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR) 85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

March 1987

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yaragadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7512 RHODES	MTLRS-1; Rhodes, Greece
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7810 ZIMMER	Inst. of Astron., Univ. of Bern; Zimmerwald, Switzerland
8833 KOTWK2	MTLRS-1; Kootwijk, The Netherlands
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7835 GRASSE	GRGS/CERGA; Grasse, France
7837 SHAHAI	Shanghai Observatory; Shanghai, PRC
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORLLR	Division of National Mapping; Orroal, Australia
7907 ARELAS	SAO; Arequipa, Peru
7935 DODAIR	Tokyo Astronomical Observatory; Dodaira, Japan
7939 MATERA	PSN; Matera, Italy

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR MARCH 1987**

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>TOTAL OBS</i>	<i>EDITED OBS⁺</i>	<i>PCT EDITED</i>	<i>GOOD OBS</i>	<i>RAW RMS</i>	<i>RB TB RMS</i>	<i>PRECISION ESTIMATE</i>
1181 POTSDM	21	670	321	47.9	349	18.9	14.5	14.0
7086 MCDON	45	2247	37	1.6	2210	6.1	3.5	3.4
7090 YARAG	10	499	4	.8	495	5.7	1.4	1.3
7105 GRF105	26	1296	61	4.7	1235	3.5	1.1	.9
7109 QUINC2	17	843	17	2.0	826	5.5	1.0	.9
7110 MNPEAK	18	899	15	1.7	884	5.6	1.0	1.0
7122 MAZTLN	19	942	20	2.1	922	4.7	1.0	.8
7210 HOLLAS	14	637	37	5.8	600	8.1	4.6	4.5
7512 RHODES	11	475	10	2.1	465	9.3	5.2	5.1
7530 BARGIY	5	252	12	4.8	240	15.9	10.6	10.5
7810 ZIMMER	6	300	6	2.0	294	14.9	7.4	7.3
8833 KOTWK2	2	68	1	1.5	67	8.4	5.3	5.2
7834 WETZEL	9	349	7	2.0	342	11.6	5.6	5.6
7835 GRASSE	21	1141	3	.3	1138	8.2	3.6	3.5
7837 SHAHAI	2	89	8	9.0	81	19.1	15.2	15.2
7838 SHO	11	341	4	1.2	337	8.8	4.7	4.1
7839 GRAZ	23	1143	6	.5	1137	6.4	3.0	2.9
7840 RGO	45	1793	16	.9	1777	6.9	4.9	4.7
7843 ORLLR	21	521	109	20.9	412	13.4	3.7	3.0
7907 ARELAS	23	1100	454	41.3	646	14.9	13.1	12.9
7935 DODAIR	5	214	204	95.3	10	20.1	15.5	10.0
7939 MATERA	23	1142	64	5.6	1078	14.3	12.6	12.4
TOTALS	377	16961	1416	8.3	15545	9.0	6.0	5.9

+ See Edit Criteria listed in the January 1986 report.

QUICK-LOOK NORMAL POINT SUMMARY FOR MARCH 1987

STA ID	NO OF PASSES	NO OF NPTS	PTS/ NPT	NPTS/ PASS	EF SIG	NPT WRMS	AF SIG	NPT RMS
1181 POTSDM	18	116	3.0	6.4	8.0	7.0	13.6	9.8
7086 MCDON	45	455	4.9	10.1	1.3	1.3	1.7	1.8
7090 YARAG	10	132	3.8	13.2	.6	.6	.7	.7
7105 GRF105	25	271	4.6	10.8	.4	.4	.5	.5
7109 QUINC2	17	203	4.1	11.9	.4	.4	.6	.6
7110 MNPEAK	18	185	4.8	10.3	.4	.4	.5	.6
7122 MAZTLN	19	206	4.5	10.8	.4	.4	.5	.5
7210 HOLLAS	14	104	5.8	7.4	1.4	1.5	2.1	2.7
7512 RHODES	11	64	7.3	5.8	1.7	1.8	2.6	3.0
7530 BARGIY	5	51	4.7	10.2	4.7	4.1	5.8	5.2
7810 ZIMMER	6	62	4.7	10.3	3.3	2.8	4.1	3.7
8833 KOTWK2	2	16	4.2	8.0	2.4	2.3	3.5	3.3
7834 WETZEL	9	46	7.4	5.1	2.0	1.8	2.5	2.5
7835 GRASSE	21	230	4.9	11.0	1.5	1.4	1.9	2.0
7837 SHAHAI	2	16	5.1	8.0	6.8	5.8	8.3	7.9
7838 SHO	11	98	3.4	8.9	2.0	2.2	2.4	2.7
7839 GRAZ	23	219	5.2	9.5	1.2	1.2	1.5	1.7
7840 RGO	44	454	3.9	10.3	2.3	2.1	3.2	2.6
7843 ORLLR	17	153	2.7	9.0	1.3	1.3	1.8	1.9
7907 ARELAS	20	152	4.3	7.6	6.0	5.4	7.8	7.4
7935 DODAIR	3	10	1.0	3.3	50.0	10.0	50.0	10.0
7939 MATERA	23	285	3.8	12.4	6.1	5.7	7.0	6.7
TOTALS	363	3528	4.4	9.7	.7	.7	3.0	3.6

ANALYSIS OF LAGEOS LASER RANGE DATA

APRIL 1987

**CENTER FOR SPACE RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712**

**PREPARED FOR:
NASA CONTRACT NAS5-27344**

ANALYSIS OF LAGEOS LASER RANGE DATA

CONTENTS

- A. Polar Motion Solutions from Quick-Look Data
- B. Monthly Quick-Look Data Summary and Quality

Questions and comments should be addressed to:

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A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

APRIL 1987 RAW VALUES
System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
797	87	4	4	46889	-72	930	2052	1718	23	23	150	36	-15	-8	15
798	87	4	9	46894	0	877	2056	1627	18	19	103	47	8	11	17
799	87	4	14	46899	69	790	2012	1614	23	21	176	42	4	19	14
800	87	4	19	46904	-22	765	2052	1588	23	28	100	48	-7	18	11
801	87	4	24	46909	-3	702	2017	1402	15	21	160	48	-8	-12	13
802	87	4	29	46914	12	645	1988	1620	19	20	128	49	-4	6	16

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year MM: Month DD: Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of XP estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of YP estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of DR estimate (units: 1 μ s)

CXY: Correlation coefficient between XP and YP (units: 0.01)

CXD: Correlation coefficient between XP and DR (units: 0.01)

CYD: Correlation coefficient between YP and DR (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$
and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 797 ARC DATE: 87 4 4 (46889)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	95	9.7
7090 YARAG	50	29	17.5
7105 GRF105	50	20	5.6
7109 QUINC2	50	27	6.2
7110 MNPEAK	50	53	9.4
7122 MAZTLN	50	34	6.3
7210 HOLLAS	50	32	12.0
7530 BARGIY	10000	31	15.2
7810 ZIMMER	100	10	8.3
7834 WETZEL	50	7	6.7
7835 GRASSE	200	19	13.0
7839 GRAZ	50	24	9.0
7840 RGO	50	43	11.6
7907 ARELAS	50	25	10.4
7939 MATERA	50	30	10.6
TOTALS		479	10.3

ARC NO. 798 ARC DATE: 87 4 9 (46894)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	10	19.3
7086 MCDON	50	59	8.6
7090 YARAG	50	20	22.4
7105 GRF105	50	107	8.0
7109 QUINC2	50	47	4.9
7110 MNPEAK	50	109	8.4
7122 MAZTLN	50	17	4.9
7210 HOLLAS	50	61	10.3
7530 BARGIY	10000	8	15.0
7810 ZIMMER	100	9	9.1
7834 WETZEL	50	13	3.5
7835 GRASSE	200	20	9.7
7839 GRAZ	50	15	9.3
7840 RGO	50	46	10.7
7843 ORLLR	200	15	16.7
7907 ARELAS	50	29	11.9
7939 MATERA	50	132	14.1
TOTALS		717	10.7

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 799 ARC DATE: 87 4 14 (46899)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
1181 POTSDM	100	12	19.9
7086 MCDON	50	72	8.3
7090 YARAG	50	53	14.5
7105 GRF105	50	24	9.9
7109 QUINC2	50	68	6.5
7110 MNPEAK	50	73	9.7
7122 MAZTLN	50	12	9.5
7810 ZIMMER	100	44	10.2
7835 GRASSE	200	65	13.8
7838 SHO	50	7	8.4
7839 GRAZ	50	26	12.2
7840 RGO	50	26	10.7
7907 ARELAS	50	8	5.9
7939 MATERA	50	60	11.2
TOTALS		550	10.3

ARC NO. 800 ARC DATE: 87 4 19 (46904)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
7086 MCDON	50	6	8.9
7105 GRF105	50	12	15.6
7109 QUINC2	50	44	7.5
7110 MNPEAK	50	46	6.6
7210 HOLLAS	50	24	11.9
7810 ZIMMER	100	44	7.6
7835 GRASSE	200	80	11.3
7839 GRAZ	50	12	6.4
7840 RGO	50	114	8.9
7907 ARELAS	50	44	13.1
7939 MATERA	50	130	11.0
TOTALS		556	10.0

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 801 ARC DATE: 87 4 24 (46909)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
7105 GRF105	50	26	9.7
7109 QUINC2	50	103	7.1
7110 MNPEAK	50	111	6.9
7210 HOLLAS	50	62	9.0
7580 MELENG	10000	57	17.2
7810 ZIMMER	100	59	9.1
7835 GRASSE	200	70	13.9
7838 SHO	50	12	16.8
7839 GRAZ	50	79	7.2
7840 RGO	50	139	8.2
7843 ORRLLR	200	61	20.2
7907 ARELAS	50	12	10.1
7939 MATERA	50	139	11.5
TOTALS		930	9.1

ARC NO. 802 ARC DATE: 87 4 29 (46914)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
1181 POTSDM	100	13	17.4
7086 MCDON	50	33	10.7
7105 GRF105	50	44	9.1
7109 QUINC2	50	63	5.3
7110 MNPEAK	50	26	7.3
7210 HOLLAS	50	28	15.3
7580 MELENG	10000	25	15.7
7805 METFIN	200	4	11.4
7810 ZIMMER	100	27	10.9
7837 SHAHAI	500	11	17.8
7838 SHO	50	8	8.2
7839 GRAZ	50	108	6.3
7840 RGO	50	108	8.9
7843 ORRLLR	200	9	7.3
7907 ARELAS	50	20	12.0
7939 MATERA	50	140	11.5
TOTALS		667	9.6

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR) 85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

April 1987

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yaragadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7512 RHODES	MTLRS-2; Rhodes, Greece
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7575 DIYARB	MTLRS-1; Diyarbakir, Turkey
7580 MELENG	TLRS-1; Melengiclik, Turkey
7805 METFIN	Geodetic Institute; Metsahovi, Finland
7810 ZIMMER	Inst. of Astron., Univ. of Bern; Zimmerwald, Switzerland
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7835 GRASSE	GRGS/CERGA; Grasse, France
7837 SHAHAI	Shanghai Observatory; Shanghai, PRC
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORLLR	Division of National Mapping; Orrol, Australia
7907 ARELAS	SAO; Arequipa, Peru
7935 DODAIR	Tokyo Astronomical Observatory; Dodaira, Japan
7939 MATERA	PSN; Matera, Italy

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR APRIL 1987**

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>TOTAL OBS</i>	<i>EDITED OBS⁺</i>	<i>PCT EDITED</i>	<i>GOOD OBS</i>	<i>RAW RMS</i>	<i>RB TB RMS</i>	<i>PRECISION ESTIMATE</i>
1181 POTSDM	11	255	161	63.1	94	20.5	16.0	15.4
7086 MCDON	30	1490	22	1.5	1468	5.4	3.4	3.3
7090 YARAG	10	499	11	2.2	488	4.3	1.5	1.2
7105 GRF105	23	1147	58	5.1	1089	2.5	1.0	.9
7109 QUINC2	30	1499	16	1.1	1483	3.4	.9	.9
7110 MNPEAK	42	2099	32	1.5	2067	4.5	1.1	1.0
7122 MAZTLN	6	296	3	1.0	293	3.2	.9	.9
7210 HOLLAS	23	1095	53	4.8	1042	5.2	3.0	3.0
7512 RHODES	34	1617	11	.7	1606	8.5	4.7	4.6
7530 BARGIY	6	257	51	19.8	206	14.1	12.4	12.2
7575 DIYARB	12	525	16	3.0	509	10.0	4.9	4.9
7580 MELENG	30	1424	329	23.1	1095	8.3	1.5	1.3
7805 METFIN	2	17	13	76.5	4	21.1	4.1	3.9
7810 ZIMMER	21	1049	6	.6	1043	11.7	7.7	7.7
7834 WETZEL	3	108	6	5.6	102	10.0	3.9	3.7
7835 GRASSE	24	1295	59	4.6	1236	11.3	4.2	4.1
7837 SHAHAI	2	99	6	6.1	93	21.0	11.5	11.2
7838 SHO	3	101	0	0.0	101	7.2	4.5	3.6
7839 GRAZ	29	1413	6	.4	1407	6.0	2.9	2.8
7840 RGO	52	1870	53	2.8	1817	7.2	5.3	5.1
7843 ORLLR	12	300	2	.7	298	10.5	4.1	3.3
7907 ARELAS	22	981	371	37.8	610	15.4	13.7	13.6
7935 DODAIR	2	59	55	93.2	4	18.0	12.7	12.7
7939 MATERA	47	2315	104	4.5	2211	14.1	12.7	12.4
TOTALS	476	21810	1444	6.6	20366	8.8	6.2	6.0

+ See Edit Criteria listed in the January 1986 report.

QUICK-LOOK NORMAL POINT SUMMARY FOR APRIL 1987

STA ID	NO OF PASSES	NO OF NPTS	PTS/ NPT	NPTS/ PASS	EF SIG	NPT WRMS	AF SIG	NPT RMS
1181 POTSDM	6	36	2.6	6.0	10.4	8.1	20.4	11.3
7086 MCDON	30	303	4.8	10.1	1.4	1.4	1.7	2.0
7090 YARAG	10	124	3.9	12.4	.6	.6	.7	.7
7105 GRF105	22	243	4.5	11.0	.4	.4	.5	.5
7109 QUINC2	30	389	3.8	13.0	.4	.4	.5	.5
7110 MNPEAK	42	449	4.6	10.7	.5	.4	.6	.6
7122 MAZTLN	6	63	4.7	10.5	.4	.4	.5	.5
7210 HOLLAS	23	191	5.5	8.3	1.2	1.0	1.4	1.3
7512 RHODES	34	233	6.9	6.9	1.7	1.6	2.5	2.9
7530 BARGIY	5	39	5.3	7.8	5.0	6.1	7.0	9.6
7575 DIYARB	11	61	8.3	5.5	1.7	1.5	2.3	2.4
7580 MELENG	24	183	6.0	7.6	.5	.5	.9	.6
7805 METFIN	2	3	1.3	1.5	43.3	0.0	45.1	0.0
7810 ZIMMER	21	202	5.2	9.6	3.2	3.0	3.9	4.1
7834 WETZEL	3	20	5.1	6.7	1.6	1.5	1.8	1.8
7835 GRASSE	23	268	4.6	11.7	1.8	1.7	2.1	2.3
7837 SHAHAI	2	17	5.5	8.5	3.3	3.2	5.5	4.5
7838 SHO	3	27	3.7	9.0	1.6	2.1	2.0	3.1
7839 GRAZ	29	255	5.5	8.8	1.1	1.0	1.4	1.4
7840 RGO	51	488	3.7	9.6	2.5	2.4	3.5	3.1
7843 ORRLLR	12	111	2.7	9.3	1.8	1.8	2.0	2.1
7907 ARELAS	20	132	4.6	6.6	6.0	5.0	7.8	7.4
7935 DODAIR	1	3	1.3	3.0	43.3	1.6	45.1	1.7
7939 MATERA	47	617	3.6	13.1	6.4	6.2	7.0	6.9
TOTALS	457	4457	4.6	9.8	.7	.7	2.9	3.7

ANALYSIS OF LAGEOS LASER RANGE DATA

MAY 1987

CENTER FOR SPACE RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712

PREPARED FOR:
NASA CONTRACT NAS5-27344

ANALYSIS OF LAGEOS LASER RANGE DATA

CONTENTS

- A. Polar-Motion Solutions from Quick-Look Data
- B. Monthly Quick-Look Data Summary and Quality

Questions and comments should be addressed to:

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A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

MAY 1987 RAW VALUES
System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
803	87	5	4	46919	21	586	1960	1441	22	21	129	34	18	9	16
804	87	5	9	46924	-13	536	1960	1255	18	18	138	31	6	10	16
805	87	5	14	46929	9	428	1922	1322	22	22	101	29	-8	-16	15
806	87	5	19	46934	33	349	1903	1322	22	21	156	30	-1	13	10
807	87	5	24	46939	-3	330	1913	1259	23	25	127	25	9	-19	15
808	87	5	29	46944	-46	260	1929	1586	34	30	284	53	16	24	15

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year MM: Month DD: Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of XP estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of YP estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of DR estimate (units: 1 μ s)

CXY: Correlation coefficient between XP and YP (units: 0.01)

CXD: Correlation coefficient between XP and DR (units: 0.01)

CYD: Correlation coefficient between YP and DR (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$
and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 803 ARC DATE: 87 5 4 (46919)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	2	14.4
7086 MCDON	50	70	12.1
7090 YARAG	50	19	17.3
7105 GRF105	50	55	8.1
7109 QUINC2	50	68	4.6
7110 MNPEAK	50	79	6.8
7210 HOLLAS	50	17	12.8
7580 MELENG	10000	30	15.0
7805 METFIN	200	4	17.5
7810 ZIMMER	100	40	12.5
7838 SHO	50	10	9.7
7839 GRAZ	50	17	9.7
7840 RGO	50	96	9.5
7843 ORLLR	200	58	13.5
7907 ARELAS	50	10	10.6
7939 MATERA	50	31	10.4
TOTALS		606	9.7

ARC NO. 804 ARC DATE: 87 5 9 (46924)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	39	16.0
7090 YARAG	50	3	20.5
7105 GRF105	50	144	7.0
7109 QUINC2	50	66	5.2
7110 MNPEAK	50	61	5.8
7210 HOLLAS	50	38	8.4
7530 BARGIY	10000	14	10.1
7580 MELENG	10000	37	22.0
7805 METFIN	200	4	23.0
7810 ZIMMER	100	32	6.9
7838 SHO	50	14	10.7
7839 GRAZ	50	12	12.7
7840 RGO	50	120	8.3
7843 ORLLR	200	8	28.6
7907 ARELAS	50	14	12.4
7939 MATERA	50	78	10.7
TOTALS		684	8.5

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 805 ARC DATE: 87 5 14 (46929)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	7	20.0
7086 MCDON	50	17	7.2
7090 YARAG	50	55	16.4
7105 GRF105	50	16	7.4
7109 QUINC2	50	73	6.3
7110 MNPEAK	50	67	6.8
7122 MAZTLN	50	7	12.2
7210 HOLLAS	50	90	10.4
7530 BARGIY	10000	5	25.2
7580 MELENG	10000	18	19.7
7835 GRASSE	200	93	11.6
7837 SHAHAI	500	3	12.9
7840 RGO	50	76	10.0
7907 ARELAS	50	13	17.6
7939 MATERA	50	15	11.1
TOTALS		555	10.5

ARC NO. 806 ARC DATE: 87 5 19 (46934)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	20	13.0
7090 YARAG	50	77	12.9
7105 GRF105	50	44	7.7
7109 QUINC2	50	29	8.2
7110 MNPEAK	50	32	10.5
7210 HOLLAS	50	59	10.6
7834 WETZEL	50	34	8.5
7840 RGO	50	47	9.7
7907 ARELAS	50	18	10.5
7939 MATERA	50	64	11.8
TOTALS		424	10.7

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 807 ARC DATE: 87 5 24 (46939)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
1181 POTSDM	100	16	15.5
7086 MCDON	50	17	17.4
7090 YARAG	50	56	10.3
7105 GRF105	50	19	7.5
7109 QUINC2	50	17	6.8
7110 MNPEAK	50	34	9.1
7210 HOLLAS	50	21	12.7
7530 BARGIY	10000	11	14.3
7834 WETZEL	50	29	13.0
7835 GRASSE	200	82	9.3
7838 SHO	50	5	17.6
7839 GRAZ	50	6	5.7
7840 RGO	50	56	9.5
7907 ARELAS	50	8	14.9
7939 MATERA	50	81	11.3
TOTALS		458	11.1

ARC NO. 808 ARC DATE: 87 5 29 (46944)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
1181 POTSDM	100	6	19.6
7086 MCDON	50	58	5.9
7090 YARAG	50	3	20.2
7105 GRF105	50	26	5.9
7109 QUINC2	50	10	7.9
7110 MNPEAK	50	48	4.7
7122 MAZTLN	50	8	1.6
7210 HOLLAS	50	50	7.2
7530 BARGIY	10000	9	17.8
7834 WETZEL	50	32	6.5
7835 GRASSE	200	18	7.0
7838 SHO	50	9	9.4
7840 RGO	50	4	16.3
7907 ARELAS	50	7	8.6
7939 MATERA	50	37	11.1
TOTALS		325	7.7

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR)-85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

May 1987

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yaragadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7512 RHODES	MTLRS-2; Rhodes, Greece
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7575 DIYARB	MTLRS-1; Diyarbakir, Turkey
7580 MELENG	TLRS-1; Melengiclik, Turkey
7585 YOZGAT	MTLRS-1; Yozgat, Turkey
7587 YIGILC	TLRS-1; Yigilca, Turkey
7805 METFIN	Geodetic Institute; Metsahovi, Finland
7810 ZIMMER	Inst. of Astron., Univ. of Bern; Zimmerwald, Switzerland
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7835 GRASSE	GRGS/CERGA; Grasse, France
7837 SHAHAI	Shanghai Observatory; Shanghai, PRC
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORLLR	Division of National Mapping; Orroral, Australia
7907 ARELAS	SAO; Arequipa, Peru
7939 MATERA	PSN; Matera, Italy

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR MAY 1987**

STA ID	NO OF PASSES	TOTAL OBS	EDITED OBS ⁺	PCT EDITED	GOOD OBS	RAW RMS	RB TB RMS	PRECISION ESTIMATE
1181 POTSDM	9	461	234	50.8	227	20.8	15.7	14.9
7086 MCDON	22	1092	16	1.5	1076	6.4	4.2	4.1
7090 YARAG	22	1094	23	2.1	1071	3.4	1.1	.9
7105 GRF105	35	1812	176	9.7	1636	3.2	1.1	1.1
7109 QUINC2	23	1147	24	2.1	1123	3.8	.9	.8
7110 MNPEAK	30	1497	16	1.1	1481	4.5	1.1	1.0
7122 MAZTLN	2	100	1	1.0	99	4.2	.9	.9
7210 HOLLAS	32	1551	51	3.3	1500	5.4	3.1	3.0
7512 RHODES	6	275	0	0.0	275	8.2	5.3	5.3
7530 BARGIY	5	222	23	10.4	199	14.8	11.7	11.3
7575 DIYARB	20	873	53	6.1	820	10.4	5.2	5.0
7580 MELENG	13	601	27	4.5	574	5.3	1.4	1.3
7585 YOZGAT*	1	15	15	100.0	0	0.0	0.0	0.0
7587 YIGILC*	1	50	50	100.0	0	0.0	0.0	0.0
7805 METFIN	3	30	29	96.7	1	.8	0.0	.0
7810 ZIMMER	8	400	5	1.3	395	14.8	8.8	8.7
7834 WETZEL	13	447	3	.7	444	11.4	4.5	4.5
7835 GRASSE	22	1203	5	.4	1198	10.8	5.0	4.9
7837 SHAHAI	2	78	26	33.3	52	16.5	13.7	13.7
7838 SHO	6	185	4	2.2	181	9.7	5.5	5.1
7839 GRAZ	6	294	1	.3	293	5.0	2.9	2.9
7840 RGO	42	1556	18	1.2	1538	7.0	5.6	5.3
7843 ORLLR	8	209	4	1.9	205	10.7	3.9	3.4
7907 ARELAS	13	598	298	49.8	300	14.3	13.4	13.1
7939 MATERA	32	1419	59	4.2	1360	14.0	12.8	12.6
TOTALS	376	17209	1161	6.7	16048	8.6	5.9	5.8

+ See Edit Criteria listed in the January 1986 report.

* Analysis used preliminary station positions.

QUICK-LOOK NORMAL POINT SUMMARY FOR MAY 1987

STA ID	NO OF PASSES	NO OF NPTS	PTS/ NPT	NPTS/ PASS	EF SIG	NPT WRMS	AF SIG	NPT RMS
1181 POTSDM	9	68	3.3	7.6	8.1	8.2	13.8	9.4
7086 MCDON	22	196	5.5	8.9	1.5	1.4	2.1	2.3
7090 YARAG	22	213	5.0	9.7	.4	.4	.5	.5
7105 GRF105	34	318	5.1	9.4	.4	.4	.8	.6
7109 QUINC2	23	265	4.2	11.5	.4	.4	.5	.5
7110 MNPEAK	30	320	4.6	10.7	.5	.4	.6	.6
7122 MAZTLN	2	15	6.6	7.5	.4	.3	.5	.3
7210 HOLLAS	32	291	5.2	9.1	1.2	1.1	1.5	1.6
7512 RHODES	6	34	8.1	5.7	1.7	1.4	2.4	2.4
7530 BARGIY	5	39	5.1	7.8	4.9	4.4	6.1	7.2
7575 DIYARB	18	122	6.7	6.8	1.8	1.6	2.8	2.7
7580 MELENG	13	115	5.0	8.8	.6	.5	.9	.7
7805 METFIN	1	1	1.0	1.0	50.0	.0	50.0	.0
7810 ZIMMER	8	72	5.5	9.0	3.6	3.0	4.5	4.6
7834 WETZEL	13	95	4.7	7.3	1.8	1.8	2.4	2.6
7835 GRASSE	22	248	4.8	11.3	2.2	2.0	2.5	2.4
7837 SHAHAI	2	6	8.7	3.0	5.1	1.1	6.3	2.2
7838 SHO	6	38	4.8	6.3	1.1	1.3	2.5	4.2
7839 GRAZ	6	44	6.7	7.3	1.0	1.1	1.3	1.4
7840 RGO	41	408	3.8	10.0	2.6	2.3	3.5	2.9
7843 ORRLR	8	79	2.6	9.9	1.8	1.9	2.2	2.3
7907 ARELAS	12	79	3.8	6.6	6.5	5.8	11.5	8.7
7939 MATERA	29	326	4.2	11.2	6.1	5.8	6.7	6.7
TOTALS	364	3392	4.7	9.3	.7	.6	2.8	3.5

ANALYSIS OF LAGEOS LASER RANGE DATA

JUNE 1987

CENTER FOR SPACE RESEARCH
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PREPARED FOR:
NASA CONTRACT NAS5-27344

ANALYSIS OF LAGEOS LASER RANGE DATA

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GE Mark III: AUTA
BITNET: AOV5751@UTCHPC.BITNET
SPAN: UTSPAN::UTCSR::SCHUTZ

A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

JUNE 1987 RAW VALUES
System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
809	87	6	3	46949	6 269	1984	1043	22 29	165	40	3	12	14		
810	87	6	8	46954	24 228	1972	1192	26 26	135	44	8	16	15		
811	87	6	13	46959	-39 179	1956	953	19 20	127	50	1	-5	18		
812	87	6	18	46964	-19 107	1964	950	21 21	105	35	5	4	14		
813	87	6	23	46969	80 48	1994	852	23 23	159	30	-8	3	14		
814	87	6	28	46974	12 -12	2033	707	22 25	136	52	5	4	17		

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year MM: Month DD: Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of XP estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of YP estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of DR estimate (units: 1 μ s)

CXY: Correlation coefficient between XP and YP (units: 0.01)

CXD: Correlation coefficient between XP and DR (units: 0.01)

CYD: Correlation coefficient between YP and DR (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$
and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 809 ARC DATE: 87 6 3 (46949)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	13	8.5
7109 QUINC2	50	62	3.8
7110 MNPEAK	50	87	3.4
7122 MAZTLN	50	47	3.6
7210 HOLLAS	50	29	6.9
7530 BARGIY	10000	6	10.9
7585 YOZGAT	10000	3	7.7
7810 ZIMMER	100	9	7.3
7834 WETZEL	50	6	9.4
7835 GRASSE	200	40	6.1
7838 SHO	50	5	11.0
7840 RGO	50	54	7.4
7907 ARELAS	50	22	15.7
7939 MATERA	50	83	10.7
TOTALS		466	7.6

ARC NO. 810 ARC DATE: 87 6 8 (46954)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	6	13.3
7105 GRF105	50	49	7.1
7109 QUINC2	50	76	4.2
7110 MNPEAK	50	66	3.7
7122 MAZTLN	50	40	2.2
7210 HOLLAS	50	30	11.2
7530 BARGIY	10000	12	7.9
7585 YOZGAT	10000	40	10.6
7587 YIGILC	10000	42	8.6
7810 ZIMMER	100	19	12.3
7835 GRASSE	200	13	7.1
7838 SHO	50	5	8.1
7840 RGO	50	23	11.8
7907 ARELAS	50	11	10.4
7939 MATERA	50	60	9.6
TOTALS		492	7.4

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 811 ARC DATE: 87 6 13 (46959)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	10	18.4
7086 MCDON	50	47	7.2
7090 YARAG	50	12	24.6
7105 GRF105	50	40	4.8
7109 QUINC2	50	91	5.9
7110 MNPEAK	50	82	6.6
7122 MAZTLN	50	58	5.8
7210 HOLLAS	50	29	8.4
7510 ASKITS	10000	13	7.1
7530 BARGIY	10000	16	17.8
7585 YOZGAT	10000	16	9.4
7587 YIGILC	10000	89	11.0
7834 WETZEL	50	2	7.4
7835 GRASSE	200	16	6.8
7839 GRAZ	50	70	6.4
7840 RGO	50	67	11.0
7907 ARELAS	50	11	8.2
7939 MATERA	50	90	10.9
TOTALS		759	8.6

ARC NO. 812 ARC DATE: 87 6 18 (46964)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	77	8.3
7105 GRF105	50	63	3.7
7109 QUINC2	50	153	6.9
7110 MNPEAK	50	101	5.1
7122 MAZTLN	50	56	6.1
7210 HOLLAS	50	34	11.8
7510 ASKITS	10000	47	15.0
7530 BARGIY	10000	14	19.2
7585 YOZGAT	10000	43	9.0
7587 YIGILC	10000	53	8.1
7838 SHO	50	12	7.0
7840 RGO	50	38	8.3
7907 ARELAS	50	7	13.9
7939 MATERA	50	58	12.3
TOTALS		756	7.8

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 813 ARC DATE: 87 6 23 (46969)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	32	10.3
7090 YARAG	50	8	9.0
7105 GRF105	50	26	7.2
7109 QUINC2	50	70	6.6
7110 MNPEAK	50	86	6.7
7210 HOLLAS	50	39	8.5
7510 ASKITS	10000	4	24.4
7585 YOZGAT	10000	25	7.9
7587 YIGILC	10000	68	5.3
7834 WETZEL	50	10	7.5
7838 SHO	50	24	7.0
7840 RGO	50	11	16.9
7907 ARELAS	50	4	12.3
7939 MATERA	50	72	11.9
TOTALS		479	9.0

ARC NO. 814 ARC DATE: 87 6 28 (46974)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	11	5.4
7090 YARAG	50	13	9.9
7105 GRF105	50	44	5.5
7109 QUINC2	50	40	7.4
7110 MNPEAK	50	91	6.6
7210 HOLLAS	50	4	22.7
7510 ASKITS	10000	37	10.7
7585 YOZGAT	10000	1	5.3
7587 YIGILC	10000	55	8.6
7810 ZIMMER	100	12	12.0
7834 WETZEL	50	26	4.1
7835 GRASSE	50	65	4.8
7838 SHO	50	19	9.5
7839 GRAZ	50	24	3.7
7840 RGO	50	21	5.0
7907 ARELAS	100	6	10.5
7939 MATERA	50	76	11.3
TOTALS		545	7.7

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR) 85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

June 1987

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yaragadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7510 ASKITS	MTLRS-2; Askites, Greece
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7585 YOZGAT	MTLRS-1; Yozgat, Turkey
7587 YIGILC	TLRS-1; Yigilca, Turkey
7810 ZIMMER	Inst. of Astron., Univ. of Bern; Zimmerwald, Switzerland
7831 HELWAN	Helwan Observatory; Helwan, Egypt
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7835 GRASSE	GRGS/CERGA; Grasse, France
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORRLLR	Division of National Mapping; Orroral, Australia
7907 ARELAS	SAO; Arequipa, Peru
7939 MATERA	PSN; Matera, Italy

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR JUNE 1987**

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>TOTAL OBS</i>	<i>EDITED OBS⁺</i>	<i>PCT EDITED</i>	<i>GOOD OBS</i>	<i>RAW RMS</i>	<i>RB TB RMS</i>	<i>PRECISION ESTIMATE</i>
1181 POTSDM	3	101	49	48.5	52	19.2	17.2	15.6
7086 MCDON	18	890	19	2.1	871	5.4	3.3	3.2
7090 YARAG	5	250	7	2.8	243	4.5	1.0	.9
7105 GRF105	22	1072	11	1.0	1061	3.1	.9	.9
7109 QUINC2	39	1946	24	1.2	1922	3.7	.9	.9
7110 MNPEAK	50	2495	46	1.8	2449	5.4	1.0	1.0
7122 MAZTLN	26	1296	20	1.5	1276	5.2	.9	.8
7210 HOLLAS	21	1022	53	5.2	969	5.6	3.4	3.3
7510 ASKITS	25	1072	42	3.9	1030	11.0	5.5	5.3
7530 BARGIY	7	278	29	10.4	249	15.9	12.4	12.0
7585 YOZGAT	34	1386	325	23.4	1061	8.3	5.0	4.9
7587 YIGILC	42	1956	147	7.5	1809	4.5	1.4	1.4
7810 ZIMMER	4	200	4	2.0	196	14.9	10.5	10.3
7831 HELWAN	6	95	2	2.1	93	10.4	4.6	4.6
7834 WETZEL	8	264	11	4.2	253	12.2	4.7	4.6
7835 GRASSE	17	920	4	.4	916	8.6	3.6	3.5
7838 SHO	11	346	32	9.2	314	5.6	3.4	3.2
7839 GRAZ	17	837	8	1.0	829	4.8	2.8	2.8
7840 RGO	27	925	4	.4	921	8.1	5.4	5.3
7843 ORRLLR	1	28	0	0.0	28	16.6	4.5	4.5
7907 ARELAS	9	422	281	66.6	141	16.3	15.0	14.2
7939 MATERA	44	2106	150	7.1	1956	14.1	12.6	12.3
TOTALS	436	19907	1268	6.4	18639	8.0	5.5	5.4

+ See Edit Criteria listed in the January 1986 report.

QUICK-LOOK NORMAL POINT SUMMARY FOR JUNE 1987

STA ID	NO OF PASSES	NO OF NPTS	PTS/ NPT	NPTS/ PASS	EF SIG	NPT WRMS	AF SIG	NPT RMS
1181 POTSDM	2	16	3.3	8.0	8.7	7.8	10.2	9.5
7086 MCDON	18	180	4.8	10.0	1.4	1.3	1.8	1.9
7090 YARAG	5	46	5.3	9.2	.4	.3	.5	.5
7105 GRF105	22	222	4.8	10.1	.4	.4	.5	.6
7109 QUINC2	39	492	3.9	12.6	.4	.4	.5	.6
7110 MNPEAK	50	513	4.8	10.3	.4	.4	.5	.5
7122 MAZTLN	26	288	4.4	11.1	.4	.4	.5	.5
7210 HOLLAS	21	178	5.4	8.5	1.3	1.1	1.7	1.6
7510 ASKITS	24	124	8.3	5.2	1.7	1.6	2.6	2.8
7530 BARGIY	7	49	5.1	7.0	5.1	4.8	6.7	7.8
7585 YOZGAT	25	128	8.3	5.1	1.7	1.4	2.8	2.6
7587 YIGILC	41	351	5.2	8.6	.6	.5	.9	.8
7810 ZIMMER	4	40	4.9	10.0	4.2	4.2	5.7	6.3
7831 HELWAN	6	28	3.3	4.7	1.9	1.5	2.5	2.1
7834 WETZEL	8	44	5.8	5.5	1.8	1.6	2.1	2.0
7835 GRASSE	17	169	5.4	9.9	1.3	1.1	1.6	1.4
7838 SHO	10	65	4.8	6.5	1.1	1.5	1.4	2.0
7839 GRAZ	17	127	6.5	7.5	1.1	1.0	1.4	1.5
7840 RGO	27	238	3.9	8.8	2.5	2.3	3.0	3.0
7843 ORLLR	1	11	2.5	11.0	2.8	2.2	2.9	2.3
7907 ARELAS	9	62	2.3	6.9	10.1	7.7	18.5	8.8
7939 MATERA	43	439	4.5	10.2	5.7	5.4	6.5	6.4
TOTALS	422	3810	4.9	9.0	.6	.5	2.2	3.1

ANALYSIS OF LAGEOS LASER RANGE DATA

JULY 1987

CENTER FOR SPACE RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712

PREPARED FOR:
NASA CONTRACT NAS5-27344

ANALYSIS OF LAGEOS LASER RANGE DATA

CONTENTS

- A. Polar Motion Solutions from Quick-Look Data
- B. Monthly Quick-Look Data Summary and Quality

Questions and comments should be addressed to:

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A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

JULY 1987 RAW VALUES
System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
815	87	7	3	46979	-41	-83	2017	735	24	22	168	46	-2	-1	16
816	87	7	8	46984	0	-113	2059	706	20	20	146	59	14	16	14
817	87	7	13	46989	10	-203	2099	697	24	25	113	54	14	12	17
818	87	7	18	46994	-51	-270	2094	477	25	23	230	38	-8	3	15
819	87	7	23	46999	-14	-274	2155	536	19	19	109	46	11	-1	18
820	87	7	28	47004	53	-265	2212	419	20	22	164	35	14	1	17

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year MM: Month DD: Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of XP estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of YP estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of DR estimate (units: 1 μ s)

CXY: Correlation coefficient between XP and YP (units: 0.01)

CXD: Correlation coefficient between XP and DR (units: 0.01)

CYD: Correlation coefficient between YP and DR (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$
and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 815 ARC DATE: 87 7 3 (46979)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	88	8.9
7090 YARAG	50	32	17.4
7105 GRF105	50	10	3.4
7109 QUINC2	50	88	5.6
7110 MNPEAK	50	69	9.5
7210 HOLLAS	50	13	8.6
7510 ASKITS	10000	92	9.7
7585 YOZGAT	10000	11	15.0
7587 YIGILC	10000	12	6.0
7831 HELWAN	200	25	5.7
7834 WETZEL	50	7	6.7
7835 GRASSE	50	9	2.6
7839 GRAZ	50	23	4.3
7840 RGO	50	112	8.0
7907 ARELAS	100	9	19.9
7939 MATERA	50	13	9.2
TOTALS		613	8.9

ARC NO. 816 ARC DATE: 87 7 8 (46984)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	9	13.3
7086 MCDON	50	93	9.5
7105 GRF105	50	6	11.7
7109 QUINC2	50	88	6.0
7110 MNPEAK	50	110	8.8
7831 HELWAN	200	22	7.6
7834 WETZEL	50	54	7.4
7835 GRASSE	50	47	6.0
7838 SHO	50	7	4.7
7839 GRAZ	50	50	5.7
7840 RGO	50	75	9.3
7843 ORRLLR	200	12	21.3
7907 ARELAS	100	48	17.1
7939 MATERA	50	94	10.1
TOTALS		715	8.6

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 817 ARC DATE: 87 7 13 (46989)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	27	15.2
7086 MCDON	50	14	12.2
7090 YARAG	50	19	12.5
7105 GRF105	50	33	5.6
7109 QUINC2	50	33	3.8
7110 MNPEAK	50	63	9.3
7122 MAZTLN	50	7	13.7
7210 HOLLAS	50	9	2.6
7510 ASKITS	10000	27	8.8
7810 ZIMMER	100	9	4.7
7831 HELWAN	200	22	5.7
7834 WETZEL	50	63	6.9
7839 GRAZ	50	34	4.7
7840 RGO	50	78	8.5
7843 ORLLR	200	25	14.9
7907 ARELAS	100	15	19.1
7939 MATERA	50	108	9.8
TOTALS		586	8.8

ARC NO. 818 ARC DATE: 87 7 18 (46994)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	33	12.8
7090 YARAG	50	30	21.8
7105 GRF105	50	64	6.3
7109 QUINC2	50	18	7.8
7110 MNPEAK	50	51	10.2
7122 MAZTLN	50	25	3.4
7210 HOLLAS	50	32	13.5
7510 ASKITS	10000	13	11.2
7530 BARGIY	10000	23	16.2
7831 HELWAN	200	26	7.9
7834 WETZEL	50	2	2.7
7839 GRAZ	50	41	3.9
7840 RGO	50	15	17.8
7907 ARELAS	100	32	14.3
7939 MATERA	50	67	11.2
TOTALS		472	11.4

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 819 ARC DATE: 87 7 23 (46999)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	6	14.2
7086 MCDON	50	52	5.9
7090 YARAG	50	24	14.3
7105 GRF105	50	61	5.1
7109 QUINC2	50	64	6.0
7110 MNPEAK	50	121	7.4
7122 MAZTLN	50	67	4.9
7210 HOLLAS	50	39	11.1
7510 ASKITS	10000	73	9.0
7530 BARGIY	10000	43	12.7
7831 HELWAN	200	32	7.4
7834 WETZEL	50	18	8.6
7838 SHO	50	11	3.6
7839 GRAZ	50	42	3.9
7840 RGO	50	13	8.1
7843 ORRLLR	200	9	13.3
7907 ARELAS	100	65	18.6
7939 MATERA	50	102	9.1
TOTALS		842	8.0

ARC NO. 820 ARC DATE: 87 7 28 (47004)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7105 GRF105	50	46	4.8
7109 QUINC2	50	95	6.2
7110 MNPEAK	50	83	4.4
7123 HUAH2	10000	47	13.7
7210 HOLLAS	50	52	11.2
7510 ASKITS	10000	40	9.3
7515 DIONS2	10000	53	14.3
7517 ROUMEL	10000	62	10.8
7530 BARGIY	10000	46	18.6
7810 ZIMMER	100	11	9.2
7831 HELWAN	200	42	12.4
7834 WETZEL	50	29	7.3
7838 SHO	50	12	3.4
7840 RGO	50	73	5.2
7843 ORRLLR	200	34	16.7
7907 ARELAS	100	13	11.5
7939 MATERA	50	57	9.4
TOTALS		795	7.1

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR) 85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

July 1987

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yaragadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7123 HUAHI2	TLRS-2; Huahine, French Polynesia
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7510 ASKITS	MTLRS-2; Askites, Greece
7515 DIONS2	MTLRS-1; Dionysos, Greece
7517 ROUMEL	TLRS-2; Roumelli, Greece
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7585 YOZGAT	MTLRS-1; Yozgat, Turkey
7810 ZIMMER	Inst. of Astron., Univ. of Bern; Zimmerwald, Switzerland
7831 HELWAN	Helwan Observatory; Helwan, Egypt
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7835 GRASSE	GRGS/CERGA; Grasse, France
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORLLR	Division of National Mapping; Orroral, Australia
7907 ARELAS	SAO; Arequipa, Peru
7939 MATERA	PSN; Matera, Italy

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR JULY 1987**

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>TOTAL OBS</i>	<i>EDITED OBS⁺</i>	<i>PCT EDITED</i>	<i>GOOD OBS</i>	<i>RAW RMS</i>	<i>RB TB RMS</i>	<i>PRECISION ESTIMATE</i>
1181 POTSDM	8	277	146	52.7	131	19.4	16.1	15.5
7086 MCDON	31	1545	11	.7	1534	6.5	4.3	4.2
7090 YARAG	12	598	16	2.7	582	3.6	1.0	.9
7105 GRF105	26	1271	63	5.0	1208	3.0	.9	.8
7109 QUINC2	36	1799	24	1.3	1775	3.4	.9	.8
7110 MNPEAK	48	2398	24	1.0	2374	5.2	1.1	1.0
7122 MAZTLN	15	749	8	1.1	741	6.1	1.0	.9
7123 HUAH2	13	558	1	.2	557	13.6	3.1	3.0
7210 HOLLAS	18	836	39	4.7	797	6.3	3.4	3.3
7510 ASKITS	56	2319	148	6.4	2171	9.6	5.2	5.1
7515 DIONS2	14	602	51	8.5	551	8.4	5.6	5.6
7517 ROUMEL	18	894	26	2.9	868	10.6	2.1	1.4
7530 BARGIY	13	608	113	18.6	495	16.8	13.1	12.8
7585 YOZGAT	1	50	0	0.0	50	6.5	4.8	4.8
7810 ZIMMER	4	177	7	4.0	170	15.0	7.3	7.3
7831 HELWAN	31	452	6	1.3	446	7.1	3.9	3.8
7834 WETZEL	27	916	40	4.4	876	11.0	4.1	4.0
7835 GRASSE	6	326	10	3.1	316	7.7	3.5	3.3
7838 SHO	5	156	2	1.3	154	5.8	2.4	2.3
7839 GRAZ	23	1368	259	18.9	1109	5.3	2.7	2.7
7840 RGO	43	1398	19	1.4	1379	7.5	5.0	4.9
7843 ORRLR	8	234	1	.4	233	10.9	3.5	3.3
7907 ARELAS	20	944	302	32.0	642	17.0	14.7	14.4
7939 MATERA	53	2525	173	6.9	2352	13.6	12.4	12.3
TOTALS		529	23000	1489	6.5	21511	9.2	6.2

+ See Edit Criteria listed in the January 1986 report.

QUICK-LOOK NORMAL POINT SUMMARY FOR JULY 1987

STA ID	NO OF PASSES	NO OF NPTS	PTS/ NPT	NPTS/ PASS	EF SIG	NPT WRMS	AF SIG	NPT RMS
1181 POTSDM	6	41	3.2	6.8	8.6	6.8	14.7	9.2
7086 MCDON	31	280	5.5	9.0	1.6	1.6	2.3	2.6
7090 YARAG	12	122	4.8	10.2	.4	.4	.5	.5
7105 GRF105	25	220	5.5	8.8	.3	.3	.5	.5
7109 QUINC2	36	429	4.1	11.9	.4	.4	.5	.5
7110 MNPEAK	48	537	4.4	11.2	.5	.5	.6	.6
7122 MAZTLN	15	160	4.6	10.7	.4	.4	.5	.5
7123 HUAH2	13	74	7.5	5.7	1.1	.9	1.4	1.6
7210 HOLLAS	18	165	4.8	9.2	1.4	1.3	2.0	1.8
7510 ASKITS	51	284	7.6	5.6	1.8	1.6	3.3	2.7
7515 DIONS2	13	79	7.0	6.1	2.0	1.9	2.9	3.0
7517 ROUMEL	18	185	4.7	10.3	.6	.6	.8	.9
7530 BARGIY	13	115	4.3	8.8	6.0	5.2	7.1	7.3
7585 YOZGAT	1	6	8.3	6.0	1.7	1.5	2.0	1.6
7810 ZIMMER	4	20	8.5	5.0	2.5	2.2	3.1	2.4
7831 HELWAN	31	201	2.2	6.5	2.2	1.8	3.0	2.8
7834 WETZEL	26	173	5.1	6.7	1.7	1.6	2.0	2.0
7835 GRASSE	6	56	5.6	9.3	1.3	1.2	1.6	1.6
7838 SHO	5	30	5.1	6.0	.7	1.3	1.1	1.7
7839 GRAZ	23	175	6.3	7.6	1.0	.9	1.3	1.2
7840 RGO	42	364	3.8	8.7	2.3	2.2	3.1	2.9
7843 ORRLR	8	84	2.8	10.5	1.6	1.7	3.5	2.2
7907 ARELAS	19	210	3.1	11.1	8.0	7.1	9.6	8.9
7939 MATERA	51	470	5.0	9.2	5.3	4.9	6.3	6.2
TOTALS	515	4480	4.8	8.7	.7	.6	2.7	3.6

ANALYSIS OF LAGEOS LASER RANGE DATA

AUGUST 1987

CENTER FOR SPACE RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN
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PREPARED FOR:
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GE Mark III: AUTA
BITNET: AOV5751@UTCHPC.BITNET
SPAN: UTSPAN::UTCSR::SCHUTZ

A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

AUGUST 1987 RAW VALUES System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
821	87	8	2	47009	3	-297	2232	477	23	21	100	40	-24	-19	16
822	87	8	7	47014	-39	-316	2293	503	19	20	109	48	-17	-20	18
823	87	8	12	47019	26	-330	2327	529	20	20	160	32	26	9	19
824	87	8	17	47024	41	-383	2362	792	18	17	96	31	7	3	16
826	87	8	27	47034	-10	-362	2513	1155	25	23	148	34	0	0	20

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year **MM:** Month **DD:** Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of **XP** estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of **YP** estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of **DR** estimate (units: 1 μ s)

CXY: Correlation coefficient between **XP** and **YP** (units: 0.01)

CXD: Correlation coefficient between **XP** and **DR** (units: 0.01)

CYD: Correlation coefficient between **YP** and **DR** (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$
and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 821 ARC DATE: 87 8 2 (47009)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	35	7.9
7090 YARAG	50	23	17.3
7105 GRF105	50	6	3.1
7109 QUINC2	50	100	7.5
7110 MNPEAK	50	80	6.9
7123 HUAH12	10000	4	19.4
7210 HOLLAS	50	55	11.3
7510 ASKITS	10000	52	9.7
7515 DIONS2	1000	45	6.1
7517 ROUMEL	10000	79	12.8
7810 ZIMMER	100	19	9.2
7831 HELWAN	200	20	10.6
7840 RGO	50	53	7.6
7843 ORLLR	200	48	15.3
7907 ARELAS	100	28	13.6
7939 MATERA	50	92	9.8
TOTALS		739	9.3

ARC NO. 822 ARC DATE: 87 8 7 (47014)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	31	14.5
7086 MCDON	50	12	4.7
7105 GRF105	50	18	7.3
7109 QUINC2	50	150	6.4
7110 MNPEAK	50	130	6.0
7123 HUAH12	10000	22	9.8
7210 HOLLAS	50	47	13.2
7510 ASKITS	10000	94	7.8
7517 ROUMEL	10000	34	9.5
7530 BARGIY	10000	18	12.4
7810 ZIMMER	100	4	5.1
7831 HELWAN	200	25	4.5
7834 WETZEL	50	49	7.1
7839 GRAZ	50	26	4.7
7840 RGO	50	18	8.8
7843 ORLLR	200	56	16.2
7907 ARELAS	100	68	15.5
7939 MATERA	50	102	9.4
TOTALS		904	8.3

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 823 ARC DATE: 87 8 12 (47019)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
1181 POTSDM	100	8	14.4
7086 MCDON	50	4	6.2
7090 YARAG	50	15	22.4
7105 GRF105	50	110	5.6
7109 QUINC2	50	105	4.9
7110 MNPEAK	50	90	6.3
7123 HUAHI2	10000	11	17.7
7210 HOLLAS	50	5	16.7
7510 ASKITS	10000	23	7.0
7515 DIONS2	1000	51	12.2
7517 ROUMEL	10000	68	10.9
7530 BARGIY	10000	17	12.8
7831 HELWAN	200	7	6.5
7834 WETZEL	50	34	8.0
7838 SHO	50	6	3.4
7839 GRAZ	50	7	10.7
7840 RGO	50	10	7.7
7907 ARELAS	100	56	12.6
7939 MATERA	50	90	10.7
TOTALS		717	8.5

ARC NO. 824 ARC DATE: 87 8 17 (47024)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
7086 MCDON	50	56	7.0
7090 YARAG	50	61	13.2
7105 GRF105	50	48	8.1
7109 QUINC2	50	57	7.6
7110 MNPEAK	50	79	11.0
7122 MAZTLN	50	6	13.3
7510 ASKITS	10000	47	9.4
7517 ROUMEL	10000	45	13.5
7831 HELWAN	200	19	6.4
7834 WETZEL	50	6	8.5
7838 SHO	50	17	5.0
7839 GRAZ	50	30	5.3
7840 RGO	50	125	7.3
7843 ORLLR	200	45	8.3
7907 ARELAS	100	48	14.6
7939 MATERA	50	89	11.9
TOTALS		778	9.6

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 826 ARC DATE: 87 8 27 (47034)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	5	16.4
7086 MCDON	50	5	.9
7105 GRF105	50	17	3.6
7109 QUINC2	50	112	5.9
7110 MNPEAK	50	107	6.0
7122 MAZTLN	50	26	6.5
7123 HUAHI2	10000	21	12.0
7210 HOLLAS	50	41	7.7
7510 ASKITS	10000	69	10.7
7515 DIONS2	1000	85	10.7
7517 ROUMEL	10000	28	11.0
7530 BARGIY	10000	11	17.3
7810 ZIMMER	100	26	7.5
7831 HELWAN	200	26	13.6
7834 WETZEL	50	2	4.5
7838 SHO	50	16	4.3
7839 GRAZ	50	41	7.6
7840 RGO	50	23	5.8
7907 ARELAS	100	75	16.8
7939 MATERA	50	20	14.2
TOTALS		756	7.6

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR) 85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

August 1987

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yaragadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7123 HUAHI2	TLRS-2; Huahine, Tahiti
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7510 ASKITS	MTLRS-2; Askites, Greece
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7585 YOZGAT	MTLRS-1; Yozgat, Turkey
7587 YIGILC	TLRS-1; Yigilca, Turkey
7810 ZIMMER	Inst. of Astron., Univ. of Bern; Zimmerwald, Switzerland
7831 HELWAN	Helwan Observatory; Helwan, Egypt
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7835 GRASSE	GRGS/CERGA; Grasse, France
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORLLR	Division of National Mapping; Orroal, Australia
7907 ARELAS	SAO; Arequipa, Peru
7939 MATERA	PSN; Matera, Italy

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR AUGUST 1987**

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>TOTAL OBS</i>	<i>EDITED OBS⁺</i>	<i>PCT EDITED</i>	<i>GOOD OBS</i>	<i>RAW RMS</i>	<i>RB TB RMS</i>	<i>PRECISION ESTIMATE</i>
1181 POTSDM	11	335	132	39.4	203	18.8	15.2	14.7
7086 MCDON	18	948	45	4.7	903	7.1	5.3	5.3
7090 YARAG	15	747	359	48.1	388	4.2	1.2	1.0
7105 GRF105	26	1245	60	4.8	1185	3.8	.9	.8
7109 QUINC2	44	2198	26	1.2	2172	3.9	.9	.8
7110 MNPEAK	44	2200	25	1.1	2175	4.9	1.2	1.1
7122 MAZTLN	5	247	-19	7.7	228	6.2	2.5	2.4
7123 HUAHI2	9	427	1	.2	426	12.4	2.9	2.7
7210 HOLLAS	12	584	46	7.9	538	5.5	3.3	3.2
7510 ASKITS	54	2501	59	2.4	2442	9.9	5.0	4.9
7515 DIONS2	30	1401	94	6.7	1307	8.7	5.5	5.4
7517 ROUMEL	35	1539	92	6.0	1447	9.9	1.7	1.3
7530 BARGIY	7	356	84	23.6	272	16.9	13.0	12.7
7810 ZIMMER*	18	923	310	33.6	613	13.2	7.1	7.1
7831 HELWAN	24	360	7	1.9	353	7.5	3.9	3.9
7834 WETZEL	23	740	68	9.2	672	9.8	4.0	3.9
7838 SHO	11	357	6	1.7	351	6.2	3.5	3.3
7839 GRAZ	15	750	7	.9	743	5.3	2.8	2.7
7840 RGO	36	1299	69	5.3	1230	7.8	6.2	5.9
7843 ORRLLR	21	608	24	3.9	584	10.5	4.1	3.6
7907 ARELAS	30	1431	348	24.3	1083	15.8	14.0	13.9
7939 MATERA	43	1984	147	7.4	1837	14.4	12.3	12.2
TOTALS	531	23180	2028	8.7	21152	9.5	6.3	6.2

+ See Edit Criteria listed in the January 1986 report.

* Statistics include data from another site that were transmitted with the wrong site number.

QUICK-LOOK NORMAL POINT SUMMARY FOR AUGUST 1987

STA ID	NO OF PASSES	NO OF NPTS	PTS/ NPT	NPTS/ PASS	EF SIG	NPT WRMS	AF SIG	NPT RMS
1181 POTSDM	11	62	3.3	5.6	8.1	6.4	13.3	8.9
7086 MCDON	18	154	5.9	8.6	1.3	1.3	2.0	2.2
7090 YARAG	8	101	3.8	12.6	.5	.5	.6	.6
7105 GRF105	25	256	4.6	10.2	.4	.4	.5	.5
7109 QUINC2	44	560	3.9	12.7	.4	.4	.5	.5
7110 MNPEAK	44	501	4.3	11.4	.5	.5	.6	.7
7122 MAZTLN	5	35	6.5	7.0	.4	.4	.9	1.0
7123 HUAHI2	9	65	6.6	7.2	1.0	.8	1.3	1.1
7210 HOLLAS	12	115	4.7	9.6	1.2	1.2	1.6	1.7
7510 ASKITS	52	309	7.9	5.9	1.7	1.5	2.5	2.6
7515 DIONS2	28	212	6.2	7.6	2.1	2.0	2.8	3.1
7517 ROUMEL	34	238	6.1	7.0	.5	.5	1.3	.8
7530 BARGIY	7	68	4.0	9.7	6.2	5.6	7.3	6.9
7810 ZIMMER	13	122	5.0	9.4	3.0	2.8	3.7	4.2
7831 HELWAN	24	129	2.7	5.4	1.9	1.7	2.6	2.6
7834 WETZEL	21	151	4.5	7.2	1.8	1.6	2.0	2.0
7838 SHO	11	69	5.1	6.3	.9	1.2	1.6	2.5
7839 GRAZ	15	142	5.2	9.5	1.1	.9	1.4	1.2
7840 RGO	34	332	3.7	9.8	2.6	2.5	3.5	3.6
7843 ORRLLR	21	218	2.7	10.4	1.6	1.7	3.1	2.6
7907 ARELAS	29	270	4.0	9.3	6.7	6.0	8.7	8.3
7939 MATERA	40	434	4.2	10.9	5.8	5.5	6.5	6.6
TOTALS	505	4543	4.7	9.0	.7	.7	2.8	3.7

ANALYSIS OF LAGEOS LASER RANGE DATA

SEPTEMBER 1987

**CENTER FOR SPACE RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712**

**PREPARED FOR:
NASA CONTRACT NAS5-27344**

ANALYSIS OF LAGEOS LASER RANGE DATA

CONTENTS

- A. Polar Motion Solutions from Quick-Look Data
- B. Monthly Quick-Look Data Summary and Quality

Questions and comments should be addressed to:

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A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

SEPTEMBER 1987 RAW VALUES
System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
827	87	9	1	47039	71	-373	2588	1010	27	28	251	38	31	13	18
828	87	9	6	47044	-36	-410	2598	1038	30	27	230	44	-46	-37	15
829	87	9	11	47049	-34	-418	2637	1170	24	22	132	49	17	12	13
830	87	9	16	47054	26	-466	2697	1227	17	16	121	32	7	-4	17
831	87	9	21	47059	36	-471	2756	1435	23	23	124	42	-8	-7	17
832	87	9	26	47064	-71	-522	2797	1557	24	22	215	37	-9	-7	15

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year MM: Month DD: Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of XP estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of YP estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of DR estimate (units: 1 μ s)

CXY: Correlation coefficient between XP and YP (units: 0.01)

CXD: Correlation coefficient between XP and DR (units: 0.01)

CYD: Correlation coefficient between YP and DR (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$
and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 827 ARC DATE: 87 9 1 (47039)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	24	17.8
7086 MCDON	50	17	5.0
7105 GRF105	50	29	4.0
7109 QUINC2	50	17	5.3
7110 MNPEAK	50	39	4.2
7123 HUAHI2	10000	36	13.9
7210 HOLLAS	50	8	3.1
7515 DIONS2	1000	72	8.4
7530 BARGIY	10000	52	17.1
7810 ZIMMER	100	67	7.3
7831 HELWAN	200	27	6.5
7834 WETZEL	50	16	8.5
7838 SHO	50	17	3.9
7839 GRAZ	50	5	5.0
7840 RGO	50	53	8.4
7843 ORLLR	200	23	14.8
7907 ARELAS	100	50	16.5
7939 MATERA	50	79	8.5
TOTALS		631	7.9

ARC NO. 828 ARC DATE: 87 9 6 (47044)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	11	10.7
7105 GRF105	50	34	3.9
7110 MNPEAK	50	54	7.0
7122 MAZTLN	50	17	1.8
7123 HUAHI2	10000	8	6.7
7515 DIONS2	1000	75	9.0
7530 BARGIY	10000	12	6.3
7810 ZIMMER	100	8	5.4
7834 WETZEL	50	36	6.4
7838 SHO	50	15	4.2
7839 GRAZ	50	20	3.2
7840 RGO	50	81	7.8
7843 ORLLR	200	14	19.1
7907 ARELAS	100	44	14.6
7939 MATERA	50	22	7.0
TOTALS		451	7.1

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 829 ARC DATE: 87 9 11 (47049)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	47	5.3
7105 GRF105	50	30	3.4
7109 QUINC2	50	44	5.2
7110 MNPEAK	50	90	6.9
7122 MAZTLN	50	51	4.7
7515 DIONS2	1000	59	9.5
7810 ZIMMER	100	50	4.8
7834 WETZEL	50	35	5.6
7839 GRAZ	50	38	4.8
7840 RGO	50	43	9.1
7843 ORRLR	200	43	16.6
7907 ARELAS	100	58	16.2
7939 MATERA	50	85	9.7
TOTALS		673	7.3

ARC NO. 830 ARC DATE: 87 9 16 (47054)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	16	7.6
7090 YARAG	50	79	12.1
7105 GRF105	50	16	6.3
7109 QUINC2	50	117	8.6
7110 MNPEAK	50	41	12.8
7122 MAZTLN	50	27	4.0
7515 DIONS2	1000	77	8.1
7530 BARGIY	10000	16	10.0
7810 ZIMMER	100	57	7.1
7831 HELWAN	200	49	7.5
7834 WETZEL	50	3	4.6
7838 SHO	50	38	9.8
7839 GRAZ	50	73	5.7
7840 RGO	50	60	6.9
7843 ORRLR	200	95	11.8
7907 ARELAS	100	57	14.7
7939 MATERA	50	118	10.5
TOTALS		939	9.4

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 831 ARC DATE: 87 9 21 (47059)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	8	9.0
7105 GRF105	50	13	5.8
7109 QUINC2	50	52	5.3
7110 MNPEAK	50	22	3.7
7122 MAZTLN	50	22	5.0
7123 HUAHI2	10000	21	10.6
7515 DIONS2	1000	44	7.9
7530 BARGIY	10000	14	8.3
7810 ZIMMER	100	28	7.6
7831 HELWAN	200	15	7.5
7834 WETZEL	50	37	5.9
7838 SHO	50	13	9.7
7839 GRAZ	50	21	8.4
7840 RGO	50	44	8.1
7843 ORLLR	200	63	16.7
7907 ARELAS	100	36	16.7
7939 MATERA	50	92	10.4
TOTALS		545	8.4

ARC NO. 832 ARC DATE: 87 9 26 (47064)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	28	15.9
7086 MCDON	50	38	9.1
7090 YARAG	50	25	19.2
7105 GRF105	50	72	5.5
7109 QUINC2	50	57	5.9
7110 MNPEAK	50	69	9.0
7123 HUAHI2	10000	19	12.1
7210 HOLLAS	50	2	13.5
7515 DIONS2	1000	75	8.7
7530 BARGIY	10000	12	14.7
7834 WETZEL	50	5	13.0
7839 GRAZ	50	28	6.3
7843 ORLLR	200	47	12.2
7907 ARELAS	100	36	13.2
7939 MATERA	50	81	11.4
TOTALS		594	9.9

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR) 85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

September 1987

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yaragadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7123 HUAHI2	TLRS-2; Huahine, Tahiti
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7544 LAMPED	MTLRS-2; Lampedusa Island, Italy
7810 ZIMMER	Inst. of Astron., Univ. of Bern; Zimmerwald, Switzerland
7831 HELWAN	Helwan Observatory; Helwan, Egypt
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORLLR	Division of National Mapping; Orrol, Australia
7907 ARELAS	SAO; Arequipa, Peru
7939 MATERA	PSN; Matera, Italy

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR SEPTEMBER 1987**

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>TOTAL OBS</i>	<i>EDITED OBS⁺</i>	<i>PCT EDITED</i>	<i>GOOD OBS</i>	<i>RAW RMS</i>	<i>RB TB RMS</i>	<i>PRECISION ESTIMATE</i>
1181 POTSDM	10	296	110	37.2	186	18.3	15.7	15.3
7086 MCDON	17	977	23	2.4	954	6.2	4.9	4.8
7090 YARAG	21	1050	8	.8	1042	2.7	1.0	.9
7105 GRF105	24	1191	13	1.1	1178	2.9	.9	.8
7109 QUINC2	25	1250	18	1.4	1232	2.6	.9	.8
7110 MNPEAK	34	1672	19	1.1	1653	4.3	1.1	1.1
7122 MAZTLN	12	595	13	2.2	582	4.0	.9	.8
7123 HUAHI2	9	424	1	.2	423	9.1	2.7	2.7
7210 HOLLAS	2	100	13	13.0	87	5.4	3.8	3.7
7515 DIONS2	51	2547	53	2.1	2494	9.5	5.1	5.1
7530 BARGIY	15	711	163	22.9	548	16.1	13.4	13.3
7544 LAMPED	16	742	103	13.9	639	7.9	5.1	5.0
7810 ZIMMER	26	1273	182	14.3	1091	14.1	8.0	7.9
7831 HELWAN	16	240	9	3.8	231	6.8	3.7	3.4
7834 WETZEL	23	750	32	4.3	718	9.9	4.2	4.1
7838 SHO	10	318	5	1.6	313	8.0	3.0	2.9
7839 GRAZ	20	999	9	.9	990	4.2	2.8	2.7
7840 RGO	27	955	10	1.0	945	9.3	6.8	6.6
7843 ORLLR	29	856	16	1.9	840	6.3	4.0	3.6
7907 ARELAS	37	1823	408	22.4	1415	15.6	13.5	13.2
7939 MATERA	39	1865	90	4.8	1775	13.6	12.7	12.4
TOTALS	463	20634	1298	6.3	19336	9.5	7.0	6.9

+ See Edit Criteria listed in the January 1986 report.

++ Data under investigation.

* Data collected for engineering evaluation prior to collocation.

QUICK-LOOK NORMAL POINT SUMMARY FOR SEPTEMBER 1987

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>NO OF NPTS</i>	<i>PTS/ NPT</i>	<i>NPTS/ PASS</i>	<i>EF SIG</i>	<i>NPT WRMS</i>	<i>AF SIG</i>	<i>NPT RMS</i>
1181 POTSDM	8	56	3.3	7.0	8.6	5.9	15.5	8.1
7086 MCDON	17	148	6.4	8.7	1.6	1.4	2.2	2.4
7090 YARAG	21	277	3.8	13.2	.5	.5	.5	.6
7105 GRF105	24	229	5.1	9.5	.3	.3	.5	.5
7109 QUINC2	25	313	3.9	12.5	.4	.4	.5	.5
7110 MNPEAK	34	330	5.0	9.7	.5	.4	.6	.6
7122 MAZTLN	12	124	4.7	10.3	.4	.4	.5	.5
7123 HUAH2	9	83	5.1	9.2	1.1	1.2	1.4	1.4
7210 HOLLAS	2	10	8.7	5.0	1.3	.7	1.6	1.4
7515 DIONS2	50	405	6.2	8.1	1.9	1.9	2.6	2.8
7530 BARGIY	14	118	4.6	8.4	6.0	5.4	7.7	7.5
7544 LAMPED	14	77	8.3	5.5	1.7	1.4	3.0	2.7
7810 ZIMMER	22	204	5.3	9.3	3.2	2.9	4.2	4.4
7831 HELWAN	16	124	1.9	7.8	2.0	1.8	2.6	2.7
7834 WETZEL	22	124	5.8	5.6	1.7	1.5	2.1	2.2
7838 SHO	10	74	4.2	7.4	.9	1.3	1.4	2.5
7839 GRAZ	20	191	5.2	9.6	1.1	1.0	1.4	1.4
7840 RGO	27	247	3.8	9.1	3.1	2.7	4.8	3.5
7843 ORRLR	29	312	2.7	10.8	1.9	2.0	2.2	2.6
7907 ARELAS	35	300	4.7	8.6	6.0	5.6	7.7	8.2
7939 MATERA	39	466	3.8	11.9	6.2	5.6	6.9	6.4
TOTALS	450	4212	4.6	9.4	.7	.7	3.2	4.0

ANALYSIS OF LAGEOS LASER RANGE DATA

OCTOBER 1987

**CENTER FOR SPACE RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712**

**PREPARED FOR:
NASA CONTRACT NAS5-27344**

ANALYSIS OF LAGEOS LASER RANGE DATA

CONTENTS

- A. Polar Motion Solutions from Quick-Look Data
- B. Monthly Quick-Look Data Summary and Quality

Questions and comments should be addressed to:

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TELEX: 704265 CSRUTX UD
GE Mark III: AUTA
BITNET: AOV5751@UTCHPC.BITNET
SPAN: UTSPAN::UTCSR::SCHUTZ

A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

OCTOBER 1987 RAW VALUES
System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
833	87	10	1	47069	46	-548	2912	1503	21	21	106	33	13	7	18
834	87	10	6	47074	11	-583	2973	1557	27	25	193	40	29	13	16
835	87	10	11	47079	-66	-619	3006	1710	21	18	93	31	7	-2	16
836	87	10	16	47084	-50	-635	3081	1578	25	23	141	24	18	5	14
837	87	10	21	47089	28	-631	3146	1512	21	16	144	13	17	-2	13
838	87	10	26	47094	35	-649	3181	1540	28	23	133	8	-30	-4	14
839	87	10	31	47099	-34	-647	3250	1549	25	25	117	19	-5	8	13

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year MM: Month DD: Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of XP estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of YP estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of DR estimate (units: 1 μ s)

CXY: Correlation coefficient between XP and YP (units: 0.01)

CXD: Correlation coefficient between XP and DR (units: 0.01)

CYD: Correlation coefficient between YP and DR (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$

and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 833 ARC DATE: 87 10 1 (47069)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	31	18.1
7086 MCDON	50	83	6.7
7105 GRF105	50	82	4.9
7109 QUINC2	50	129	5.5
7110 MNPEAK	50	29	5.6
7122 MAZTLN	50	7	3.4
7123 HUAHI2	10000	10	8.0
7210 HOLLAS	50	24	14.2
7515 DIONS2	1000	14	9.1
7530 BARGIY	10000	42	15.5
7810 ZIMMER	100	48	6.7
7834 WETZEL	50	40	8.0
7838 SHO	50	10	5.7
7839 GRAZ	50	24	3.6
7840 RGO	50	27	7.6
7843 ORRLLR	200	46	21.3
7907 ARELAS	100	52	15.1
7939 MATERA	50	56	11.6
TOTALS		754	8.0

ARC NO. 834 ARC DATE: 87 10 6 (47074)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	25	12.8
7086 MCDON	50	14	10.3
7090 YARAG	50	17	6.1
7105 GRF105	50	44	6.2
7109 QUINC2	50	24	6.2
7110 MNPEAK	50	30	6.2
7210 HOLLAS	50	38	14.9
7515 DIONS2	1000	67	9.8
7810 ZIMMER	100	17	6.0
7834 WETZEL	50	40	8.8
7838 SHO	50	9	6.9
7839 GRAZ	50	22	4.9
7840 RGO	50	24	4.3
7843 ORRLLR	200	13	15.0
7907 ARELAS	100	31	20.1
7939 MATERA	50	40	12.1
TOTALS		455	9.5

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 835 ARC DATE: 87 10 11 (47079)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
1181 POTSDM	100	8	17.0
7086 MCDON	50	57	9.2
7090 YARAG	50	28	19.2
7105 GRF105	50	80	8.0
7109 QUINC2	50	61	7.6
7110 MNPEAK	50	57	6.7
7122 MAZTLN	50	46	6.9
7210 HOLLAS	50	60	15.3
7515 DIONS2	1000	76	7.9
7834 WETZEL	50	36	7.6
7838 SHO	50	4	3.5
7839 GRAZ	50	23	5.4
7840 RGO	50	53	8.2
7843 ORRLLR	200	37	20.4
7907 ARELAS	100	24	16.5
7939 MATERA	50	41	13.6
TOTALS		691	10.4

ARC NO. 836 ARC DATE: 87 10 16 (47084)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
1181 POTSDM	100	12	12.1
7086 MCDON	50	30	7.9
7090 YARAG	50	37	12.0
7105 GRF105	50	32	6.8
7109 QUINC2	50	22	7.2
7110 MNPEAK	50	87	7.1
7122 MAZTLN	50	62	3.3
7210 HOLLAS	50	20	13.0
7515 DIONS2	1000	77	8.5
7834 WETZEL	50	21	8.2
7839 GRAZ	50	20	7.3
7840 RGO	50	27	8.7
7907 ARELAS	100	37	13.9
7939 MATERA	50	34	11.2
TOTALS		518	8.5

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 837 ARC DATE: 87 10 21 (47089)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
7086 MCDON	50	49	8.3
7090 YARAG	50	23	16.9
7105 GRF105	50	61	6.0
7109 QUINC2	50	34	6.2
7110 MNPEAK	50	62	5.8
7122 MAZTLN	50	90	4.7
7210 HOLLAS	50	7	18.8
7530 BARGIY	10000	32	11.9
7834 WETZEL	50	32	9.1
7838 SHO	50	53	11.5
7840 RGO	50	35	7.8
7907 ARELAS	100	41	12.2
7939 MATERA	50	67	11.4
TOTALS		586	9.0

ARC NO. 838 ARC DATE: 87 10 26 (47094)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
1181 POTSDM	100	1	14.0
7090 YARAG	50	75	6.9
7105 GRF105	50	21	9.0
7109 QUINC2	50	11	8.7
7122 MAZTLN	50	37	6.1
7210 HOLLAS	50	36	14.4
7517 ROUMEL	1000	40	6.9
7530 BARGIY	10000	29	11.9
7544 LAMPED	1000	29	6.0
7834 WETZEL	50	36	7.9
7838 SHO	50	7	5.5
7840 RGO	50	34	10.5
7907 ARELAS	100	40	13.0
7939 MATERA	50	44	9.5
TOTALS		440	9.3

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 839 ARC DATE: 87 10 31 (47099)

<i>STATION</i>	<i>SIGMA (CM)</i>	<i>NO. OF RANGES</i>	<i>RMS (CM)</i>
7086 MCDON	50	41	8.5
7090 YARAG	50	9	10.9
7105 GRF105	50	75	4.0
7109 QUINC2	50	20	5.6
7122 MAZTLN	50	38	5.7
7210 HOLLAS	50	56	12.3
7517 ROUMEL	1000	19	12.9
7544 LAMPED	1000	31	9.1
7810 ZIMMER	100	16	5.1
7834 WETZEL	50	36	8.1
7838 SHO	50	8	5.4
7907 ARELAS	100	23	16.2
7939 MATERA	50	37	13.1
TOTALS		409	8.9

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR) 85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

October 1987

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yaragadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7123 HUAHI2	TLRS-2; Huahine, Tahiti
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7515 DIONS2	MTLRS-1; Dionysos, Greece
7517 ROUMEL	MTLRS-1; Roumelli, Greece
7525 XRSOK	TLRS-1; Xrisokellaria, Greece
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7544 LAMPED	MTLRS-2; Lampedusa Island, Italy
7810 ZIMMER	Inst. of Astron., Univ. of Bern; Zimmerwald, Switzerland
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7835 GRASSE	GRGS/CERGA; Grasse, France
7837 SHAHAI	Shanghai Observatory; Shanghai, PRC
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORLLR	Division of National Mapping; Orroral, Australia
7907 ARELAS	SAO; Arequipa, Peru
7920 GRF920	TLRS-3; GSFC, Greenbelt, Maryland
7939 MATERA	PSN; Matera, Italy

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR OCTOBER 1987**

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>TOTAL OBS</i>	<i>EDITED OBS⁺</i>	<i>PCT EDITED</i>	<i>GOOD OBS</i>	<i>RAW RMS</i>	<i>RB TB RMS</i>	<i>PRECISION ESTIMATE</i>
1181 POTSDM	11	345	102	29.6	243	17.1	14.1	13.8
7086 MCDON	33	1614	27	1.7	1587	5.2	3.9	3.9
7090 YARAG	16	796	15	1.9	781	3.9	.9	.9
7105 GRF105	35	1730	18	1.0	1712	2.8	.9	.8
7109 QUINC2	29	1445	17	1.2	1428	3.5	1.0	.8
7110 MNPEAK	27	1349	18	1.3	1331	5.3	1.1	1.0
7122 MAZTLN	23	1142	15	1.3	1127	3.7	.9	.8
7123 HUAHI2	1	50	0	0.0	50	2.9	2.7	2.6
7210 HOLLAS	22	1100	47	4.3	1053	6.5	3.7	3.5
7515 DIONS2	38	1844	22	1.2	1822	10.3	4.9	4.8
7517 ROUMEL	9	447	1	.2	446	6.9	5.0	5.0
7525 XRIKOK	31	1263	99	7.8	1164	5.4	1.4	1.4
7530 BARGIY	10	468	86	18.4	382	15.6	13.1	13.1
7544 LAMPED	43	1890	97	5.1	1793	7.1	5.2	5.2
7810 ZIMMER	8	395	10	2.5	385	14.8	8.7	8.6
7834 WETZEL	32	1136	12	1.1	1124	9.4	4.8	4.7
7835 GRASSE	2	109	0	0.0	109	6.5	3.2	3.2
7837 SHAHAI	1	51	4	7.8	47	17.8	14.1	14.1
7838 SHO	15	473	3	.6	470	8.9	4.2	3.7
7839 GRAZ	9	448	5	1.1	443	4.1	2.9	2.9
7840 RGO	25	794	5	.6	789	7.6	6.1	5.9
7843 ORLLLR	28	664	194	29.2	470	8.3	3.1	2.8
7907 ARELAS	31	1524	417	27.4	1107	15.7	13.6	13.4
7920 GRF920	2	100	9	9.0	91	4.7	1.7	1.6
7939 MATERA	26	1248	44	3.5	1204	13.8	12.6	12.3
TOTALS	507	22425	1267	5.6	21158	8.5	6.0	5.9

+ See Edit Criteria listed in the January 1986 report.

++ Data under investigation.

* Data collected for engineering evaluation prior to collocation.

QUICK-LOOK NORMAL POINT SUMMARY FOR OCTOBER 1987

STA ID	NO OF PASSES	NO OF NPTS	PTS/ NPT	NPTS/ PASS	EF SIG	NPT WRMS	AF SIG	NPT RMS
1181 POTSDM	9	61	4.0	6.8	6.8	7.3	8.2	8.3
7086 MCDON	33	332	4.8	10.1	1.7	1.7	2.3	2.4
7090 YARAG	16	201	3.9	12.6	.4	.4	.5	.5
7105 GRF105	35	378	4.5	10.8	.4	.4	.5	.5
7109 QUINC2	29	357	4.0	12.3	.4	.4	.5	.5
7110 MNPEAK	27	302	4.4	11.2	.5	.5	.6	.6
7122 MAZTLN	23	273	4.1	11.9	.4	.4	.5	.5
7123 HUAHI2	1	7	7.1	7.0	.9	.9	1.1	1.0
7210 HOLLAS	22	206	5.1	9.4	1.4	1.2	1.7	1.8
7515 DIONS2	37	254	7.2	6.9	1.7	1.6	2.3	2.5
7517 ROUMEL	9	62	7.2	6.9	1.8	1.8	2.6	3.0
7525 XRIKOK	27	244	4.8	9.0	.6	.5	1.1	.7
7530 BARGIY	9	84	4.5	9.3	5.7	5.1	7.0	7.3
7544 LAMPED	40	225	8.0	5.6	1.7	1.5	2.8	2.8
7810 ZIMMER	8	66	5.8	8.3	3.5	3.2	4.2	3.4
7834 WETZEL	32	250	4.5	7.8	2.0	1.9	2.4	2.5
7835 GRASSE	2	11	9.9	5.5	1.0	.7	1.4	1.4
7837 SHAHAI	1	8	5.9	8.0	5.7	8.0	7.2	10.0
7838 SHO	15	107	4.4	7.1	.8	1.2	1.5	2.3
7839 GRAZ	9	88	5.0	9.8	1.2	1.1	1.5	1.4
7840 RGO	25	212	3.7	8.5	2.7	2.6	3.5	3.7
7843 ORLLR	21	175	2.7	8.3	.7	.8	1.6	1.9
7907 ARELAS	29	246	4.5	8.5	6.2	5.9	7.9	8.3
7920 GRF920	2	16	5.7	8.0	.6	.8	.8	1.0
7939 MATERA	26	289	4.2	11.1	5.8	5.6	6.7	6.7
TOTALS	487	4454	4.8	9.1	.6	.6	2.4	3.5

ANALYSIS OF LAGEOS LASER RANGE DATA

NOVEMBER 1987

CENTER FOR SPACE RESEARCH
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78712

PREPARED FOR:
NASA CONTRACT NAS5-27344

ANALYSIS OF LAGEOS LASER RANGE DATA

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TELEX: 704265 CSRUTX UD
GE Mark III: AUTA
BITNET: AOV5751@UTCHPC.BITNET
SPAN: UTSPAN::UTC SR::SCHUTZ

A. POLAR MOTION SOLUTIONS FROM QUICK-LOOK DATA

The solutions as reported via GE Mark III are as follows:

NOVEMBER 1987 RAW VALUES
System: LPM 84.02/ERP (CSR) 84 L01

ARC	YY	MM	DD	MJD	MT	XP	YP	DR	SX	SY	SD	CXY	CXD	CYD	NSTA
840	87	11	5	47104	-40	-632	3310	1675	21	15	142	12	-15	-6	17
841	87	11	10	47109	64	-615	3377	1770	35	26	142	23	46	5	15
842	87	11	15	47114	-11	-583	3475	1832	27	21	108	1	11	-5	15
843	87	11	20	47119	-23	-568	3543	1753	29	21	114	24	10	13	13
844	87	11	25	47124	-17	-568	3631	1423	25	24	193	20	0	-11	16
845	87	11	30	47129	48	-625	3711	1529	34	34	257	14	26	11	12

ARC: Identifies consecutive 5-day intervals since Lageos launch

YY: Year MM: Month DD: Day

MJD: Modified Julian Date at midpoint of 5-day arc corresponding to calendar date, 0 hours UT

MT: Mean observation time, given as $MT = T - MJD$, where T is the average time of the observations in the 5-day arc (units: 0.01 days)

XP: x component of the pole (units: 0.0001 arcsec)

YP: y component of the pole (units: 0.0001 arcsec)

DR: Excess duration of the day ($DR = \Delta^* - 86400$ s, Δ^* = duration of the day after removing the effects of zonal tides with periods shorter than 35 days; units: 0.000001 s = 1 μ s)

SX: Formal standard deviation of XP estimate (units: 0.0001 arcsec)

SY: Formal standard deviation of YP estimate (units: 0.0001 arcsec)

SD: Formal standard deviation of DR estimate (units: 1 μ s)

CXY: Correlation coefficient between XP and YP (units: 0.01)

CXD: Correlation coefficient between XP and DR (units: 0.01)

CYD: Correlation coefficient between YP and DR (units: 0.01)

NSTA: Number of contributing stations

Lageos 5-day arc number N begins at $MJD = 42901.5 + 5N$
and has a mid-point time of $MJD = 42904.0 + 5N$.

The data used, the data quality and the model/data consistency are summarized in the following tables using the 84.02 system. All values were achieved on the final iteration of the five-day polar motion solution after editing. Station identifiers are defined in Section B. The solutions based on System 84.02 were computed using 3-minute normal points created from the quick-look data.

STATION CONTRIBUTIONS BY ARC

ARC NO. 840 ARC DATE: 87 11 5 (47104)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	81	11.1
7090 YARAG	50	81	12.7
7105 GRF105	50	61	6.4
7109 QUINC2	50	40	10.7
7110 MNPEAK	50	13	5.8
7122 MAZTLN	50	58	3.9
7210 HOLLAS	50	3	25.2
7517 ROUMEL	1000	31	4.9
7530 BARGIY	10000	18	15.4
7544 LAMPED	1000	27	8.9
7810 ZIMMER	100	28	8.1
7834 WETZEL	50	37	8.6
7838 SHO	50	13	14.0
7839 GRAZ	50	46	5.1
7840 RGO	50	86	7.8
7907 ARELAS	100	43	12.5
7939 MATERA	50	38	10.4
TOTALS		704	9.4

ARC NO. 841 ARC DATE: 87 11 10 (47109)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	46	10.9
7090 YARAG	50	28	9.9
7105 GRF105	50	7	4.8
7109 QUINC2	50	46	4.7
7110 MNPEAK	50	89	8.4
7122 MAZTLN	50	67	6.1
7210 HOLLAS	50	9	8.2
7517 ROUMEL	1000	31	10.2
7530 BARGIY	10000	39	18.6
7810 ZIMMER	100	5	11.0
7838 SHO	50	17	9.5
7839 GRAZ	50	13	3.4
7840 RGO	50	12	7.1
7907 ARELAS	100	27	20.2
7939 MATERA	50	26	9.4
TOTALS		462	8.5

STATION CONTRIBUTIONS BY ARC

(Continued)

ARC NO. 842 ARC DATE: 87 11 15 (47114)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1181 POTSDM	100	15	18.9
7086 MCDON	50	13	7.2
7090 YARAG	50	54	10.4
7105 GRF105	50	94	7.7
7110 MNPEAK	50	4	7.2
7122 MAZTLN	50	43	7.3
7210 HOLLAS	50	10	14.4
7517 ROUMEL	1000	88	10.5
7530 BARGIY	10000	17	6.7
7810 ZIMMER	100	16	18.3
7834 WETZEL	50	12	12.9
7839 GRAZ	50	8	4.4
7840 RGO	50	101	8.7
7907 ARELAS	100	22	11.8
7939 MATERA	50	30	8.2
TOTALS		527	9.2

ARC NO. 843 ARC DATE: 87 11 20 (47119)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	60	9.1
7090 YARAG	50	50	11.7
7105 GRF105	50	73	8.1
7109 QUINC2	50	10	3.1
7110 MNPEAK	50	51	8.3
7122 MAZTLN	50	24	4.9
7210 HOLLAS	50	41	15.6
7517 ROUMEL	1000	51	8.7
7525 XRISOK	1000	3	20.4
7810 ZIMMER	100	10	17.2
7839 GRAZ	50	38	6.3
7840 RGO	50	34	8.5
7907 ARELAS	100	59	14.7
TOTALS		504	9.8

STATION CONTRIBUTIONS BY ARC
(Continued)

ARC NO. 844 ARC DATE: 87 11 25 (47124)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
7086 MCDON	50	33	9.7
7090 YARAG	50	57	8.0
7105 GRF105	50	33	7.8
7109 QUINC2	50	15	5.9
7110 MNPEAK	50	31	10.3
7122 MAZTLN	50	21	6.7
7210 HOLLAS	50	14	12.8
7517 ROUMEL	1000	77	11.1
7530 BARGIY	10000	51	13.0
7544 LAMPED	1000	20	6.3
7810 ZIMMER	100	7	20.4
7834 WETZEL	50	32	11.6
7837 SHAHAI	500	9	12.5
7839 GRAZ	50	16	5.5
7840 RGO	50	15	9.7
7939 MATERA	50	47	13.7
TOTALS		478	10.0

ARC NO. 845 ARC DATE: 87 11 30 (47129)

STATION	SIGMA (CM)	NO. OF RANGES	RMS (CM)
1953 CUBA	0	3	23.2
7086 MCDON	50	49	10.2
7090 YARAG	50	46	8.7
7122 MAZTLN	50	25	6.7
7517 ROUMEL	1000	51	9.3
7525 XRISOK	1000	1	12.1
7544 LAMPED	1000	36	11.2
7835 GRASSE	10000	30	5.3
7837 SHAHAI	500	7	24.3
7840 RGO	50	73	8.4
7907 ARELAS	100	17	14.1
7939 MATERA	50	21	12.1
TOTALS		359	9.3

B. MONTHLY QUICK-LOOK DATA SUMMARY AND QUALITY

The available quick-look data are summarized in the tables below, followed by information defining the terminology. The results have been generated using the LPM 85.11 system with station coordinates SSC (CSR) 85 L01. Information which is not available in the tables, as well as important notes pertinent to the interpretation of the data, are given below. Some data in the summary were not used in the polar motion solutions in Section A due to receipt after the solutions were reported.

CONTRIBUTING STATIONS

November 1987

STA ID	SYSTEM; LOCATION
1181 POTSDM	ZIPE; Potsdam, German Democratic Republic
7061 EASTER	TLRS-2; Easter Island
7086 MCDON	MLRS; McDonald Observatory, Ft. Davis, Texas
7090 YARAG	MOBLAS-5; Yaragadee, Australia
7105 GRF105	MOBLAS-7; GSFC, Greenbelt, Maryland
7109 QUINC2	MOBLAS-8; Quincy, California
7110 MNPEAK	MOBLAS-4; Monument Peak, California
7122 MAZTLN	MOBLAS-6; Mazatlan, Mexico
7210 HOLLAS	Haleakala Observatory; Maui, Hawaii
7517 ROUMEL	MTLRS-1; Roumeli, Greece
7525 XRSOK	TLRS-1; Xrisokellaria, Greece
7530 BARGIY	MOBLAS-2; Bar Giyyora, Israel
7544 LAMPED	MTLRS-2; Lampedusa Island, Italy
7810 ZIMMER	Inst. of Astron., Univ. of Bern; Zimmerwald, Switzerland
7834 WETZEL	IFAG; Wettzell, Federal Republic of Germany
7835 GRASSE	GRGS/CERGA; Grasse, France
7837 SHAHAI	Shanghai Observatory; Shanghai, PRC
7838 SHO	Simosato Hydrographic Observatory; Simosato, Japan
7839 GRAZ	Observatory Graz-Lustbuehel; Graz, Austria
7840 RGO	Royal Greenwich Observatory; Herstmonceux, U.K.
7843 ORRLR	Division of National Mapping; Orroral, Australia
7907 ARELAS	SAO; Arequipa, Peru
7920 GRF920	TLRS-3; GSFC, Greenbelt, Maryland
7939 MATERA	PSN; Matera, Italy

**SUMMARY OF LAGEOS QUICK-LOOK DATA RESIDUAL
ANALYSIS FOR NOVEMBER 1987**

<i>STA ID</i>	<i>NO OF PASSES</i>	<i>TOTAL OBS</i>	<i>EDITED OBS⁺</i>	<i>PCT EDITED</i>	<i>GOOD OBS</i>	<i>RAW RMS</i>	<i>RB TB RMS</i>	<i>PRECISION ESTIMATE</i>
1181 POTSDM	3	117	64	54.7	53	20.2	15.7	14.4
7061 EASTER	1	50	0	0.0	50	5.3	3.4	3.4
7086 MCDON	33	1584	21	1.3	1563	6.1	4.5	4.4
7090 YARAG	29	1446	30	2.1	1416	3.7	1.0	.9
7105 GRF105	30	1462	22	1.5	1440	2.8	1.0	.8
7109 QUINC2	12	600	7	1.2	593	2.8	.9	.8
7110 MNPEAK	20	999	13	1.3	986	9.1	1.2	1.1
7122 MAZTLN	19	1038	15	1.4	1023	4.3	.9	.9
7210 HOLLAS	17	850	206	24.2	644	10.3	7.5	7.3
7517 ROUMEL	32	1600	3	.2	1597	8.4	5.0	4.9
7525 XRIKOK	20	944	98	10.4	846	7.5	1.4	1.3
7530 BARGIY	15	710	92	13.0	618	14.7	10.9	10.8
7544 LAMPED	15	671	4	.6	667	9.3	5.7	5.6
7810 ZIMMER	11	550	5	.9	545	11.1	7.3	7.3
7834 WETZEL	14	429	3	.7	426	11.1	5.1	5.0
7835 GRASSE	26	1417	9	.6	1408	6.3	3.7	3.6
7837 SHAHAI	1	50	1	2.0	49	5.9	5.4	5.4
7838 SHO	4	126	2	1.6	124	7.5	3.8	3.5
7839 GRAZ	15	734	4	.5	730	5.2	2.9	2.8
7840 RGO	33	1324	4	.3	1320	7.2	5.4	5.1
7843 ORLLR	13	340	65	19.1	275	5.8	2.0	1.5
7907 ARELAS	17	848	154	18.2	694	14.8	12.9	12.7
7920 GRF920	13	660	309	46.8	351	8.2	1.4	1.4
7939 MATERA	17	792	78	9.8	714	13.7	12.3	12.1
TOTALS	410	19341	1209	6.3	18132	8.2	5.5	5.4

+ See Edit Criteria listed in the January 1986 report.

++ Data under investigation.

* Data collected for engineering evaluation prior to collocation.

QUICK-LOOK NORMAL POINT SUMMARY FOR NOVEMBER 1987

STA ID	NO OF PASSES	NO OF NPTS	PTS/ NPT	NPTS/ PASS	EF SIG	NPT WRMS	AF SIG	NPT RMS
1181 POTSDM	2	15	3.5	7.5	7.6	7.8	8.7	9.4
7061 EASTER	1	6	8.3	6.0	1.1	1.6	1.5	2.5
7086 MCDON	33	278	5.6	8.4	1.7	1.6	2.3	2.6
7090 YARAG	29	329	4.3	11.3	.4	.4	.5	.6
7105 GRF105	30	304	4.7	10.1	.4	.4	.5	.5
7109 QUINC2	12	122	4.9	10.2	.3	.3	.5	.5
7110 MNPEAK	20	211	4.7	10.6	.5	.5	.6	.7
7122 MAZTLN	19	228	4.5	12.0	.4	.4	.5	.5
7210 HOLLAS	15	122	5.3	8.1	1.5	1.4	3.5	4.5
7517 ROUMEL	32	310	5.2	9.7	2.1	2.1	2.7	2.8
7525 XRIKOK	20	160	5.3	8.0	.5	.5	1.4	.8
7530 BARGIY	15	125	4.9	8.3	4.4	3.5	6.0	5.1
7544 LAMPED	15	80	8.3	5.3	1.9	1.6	2.9	4.3
7810 ZIMMER	11	80	6.8	7.3	2.6	2.6	3.2	3.5
7834 WETZEL	14	97	4.4	6.9	2.2	1.7	2.7	2.3
7835 GRASSE	26	306	4.6	11.8	1.6	1.5	1.9	2.0
7837 SHAHAI	1	9	5.4	9.0	2.3	1.6	3.0	3.1
7838 SHO	4	30	4.1	7.5	1.4	2.7	2.0	3.0
7839 GRAZ	15	121	6.0	8.1	1.0	.9	1.4	1.2
7840 RGO	33	320	4.1	9.7	2.3	2.4	2.6	2.9
7843 ORRLLR	11	104	2.6	9.5	.5	.4	.8	1.1
7907 ARELAS	17	163	4.3	9.6	6.0	5.4	7.9	8.1
7920 GRF920	9	64	5.5	7.1	.5	.5	1.5	.9
7939 MATERA	15	184	3.9	12.3	6.1	6.2	6.7	7.3
TOTALS	399	3768	4.8	9.4	.6	.6	2.3	3.3